

# **Preliminary 2004 Service Plan:**

**Proposed Bus Service  
and Service Policy Modifications**

***March 2004***



**MASSACHUSETTS BAY TRANSPORTATION AUTHORITY**

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## **I. OVERVIEW**

The MBTA Board of Directors adopted its *Service Delivery Policy* in September 1996. The first service plan under this policy was implemented in phases in 1998. The second began with public outreach in the spring 1999 and concluded with the service changes that were implemented in the summer of 2002. This is the third round of changes recommended under the general guidelines found in the policy. Implementation of approved service changes from this plan is expected to begin in the fall of 2004.

Since the implementation of the 2002 Plan, the MBTA has continued to make minor service changes on a quarterly basis, with the guidance of the Service Committee. To develop this plan, the MBTA conducted seven public meetings in the fall of 2003 and early winter 2004. Written comments were also solicited. In addition, the MBTA Service Planning Department has also participated in public forums on transit issues (such as those conducted in Cambridge and Boston), led discussions on new services (such as those for the South Boston Waterfront), and contributed to other MBTA initiatives (such as the Urban Ring, the North Shore MIS, and Silver Line Phase III) to identify areas where changes would be beneficial.

This plan was developed in the context of a changing MBTA bus environment. In 2001 the MBTA introduced Night Owl Service, which provides a skeletal bus service until 3 a.m. on Saturday and Sunday mornings. In 2002 the Silver Line was inaugurated along the Washington Street corridor. With this service came improved frequency, new equipment, improved customer

information and a simple transfer policy. This year, as mitigation to the last fare increase, the MBTA will introduce the "Key Routes" program that will improve the frequency, signage, and marketing of 15 major bus routes to levels comparable to rapid transit. Changes in the routes that are a result of the Key Route initiative are not reflected in the table. Also, before the end of the year, the second phase of the Silver Line that will connect South Station to the airport, the new convention center, and the Boston Marine Industrial Park will open. Changes in local routes that are affected by this opening are included in the plan.

Finally, new buses have entered service and new buses will continue to arrive during the next two years, with a total of 578 new buses to be introduced into the fleet. Many of these buses will automatically collect data that can be used to set better schedules in or before the next service plan. Thus the service, service characteristics, the fleet itself, and the tools to plan service are all being upgraded. These changes are outside of the context of the Service Plan, but they are mentioned because some of the proposals in the plan complement them.

This plan presents a number of proposed service changes as well as proposed modifications to the Service Delivery Policy. It also identifies some service suggestions that are not recommended. Similar to the FY98 Service Plan, this plan returns to the concept of evaluating all routes against the measures defined in the *Service Delivery Policy*. Those measures are as follows: span and frequency of service, loading and schedule adherence, and net cost per passenger. As in the FY2002 plan, some

recommended changes to the *Service Delivery Policy* are also included.

The appendices to the plan present some charts that provide both a summary of the existing services and of recommended changes and a snapshot of the comparative evaluation process as it developed after some of the more costly suggestions were deleted.

The MBTA's resources are limited. As explained at the public meetings, the final plan cannot propose any net increase in resource levels. The goal of this planning process is to review the allocation of bus services and determine which changes in the allocations to individual routes are most appropriate. The public meeting and hearing process creates an opportunity for public comment on the proposed bus service changes.

Over the course of the next two years the MBTA anticipates completing a data collection process for all the rapid transit lines. Given that, in the next plan there will also be a review of services on those lines and recommendations for improvements. Commuter Rail services are also analyzed using a zero sum process within the mode. Analysis is currently underway for some of these services and is not included in this plan.

Consequently, the plan does not focus on the allocation of resources between the modes. It is also not the forum for discussion of the allocation of capital funds.

## **II. PROPOSED SERVICE CHANGE RECOMMENDATIONS**

The 2002 Service Plan resulted in a major restructuring of the routes on the North Shore that were implemented in the summer of 2002. In compliance with the MBTA *Service Delivery Policy* this plan will not attempt to reallocate resources amongst those routes because it has been such a short time since their implementation. Similarly, several changes were made to local service in the Boston area with resources reallocated from the Boston – Logan run of the CT3. Changes to routes instituted due to this resource reallocation will also not be changed.

Instead this plan reviews all routes, except those from the North Shore, for their compliance with the standards and suggests areas for improvements. In addition, due to community input, several new variations of routes, or entirely new routes are considered. All were costed out and compared to each other based both on the total net cost per passenger, as well as, the change in net cost per passenger. What follow are the results of the review and comparison.

Changes in the recommendations found in this document are anticipated as a result of the public process. Consequently not all of proposals found in this document will be implemented. In addition, it is possible that some changes will not occur due to the inability to successfully reallocate the small changes across the region that are necessary to create a cost neutral final plan.

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### **Route CT1: Boston Medical Center – Central Square**

The CT1 is a Crosstown bus that provides limited-stop weekday service between the Boston Medical Center (BMC) and Central Square, Cambridge via Massachusetts Ave. The route supplements service along the Route 1 corridor.

Due to problems with on-time performance, it is recommended that the frequency be modified during the PM peak. From 5:30 PM-6:00 PM in the outbound direction, trips would depart every 20 minutes rather than 15. Several outbound trips would also be shifted 2 minutes later such that they would depart from the route origin at 4:17pm, 4:32pm, 4:47pm, 5:02pm, 5:17pm rather than on the quarter-hour. Although this would eliminate the clockface headway, it would improve the schedule reliability.

In addition to the reliability changes, two new inbound trips would be added at the end of the route's day to take advantage of the inbound destination's proximity to Albany Garage. These two trips, as well as 2 other evening trips returning to the garage, would not service E. Newton St. or E. Concord St. but rather would terminate on Albany St. The two additional evening trips are not expected to require significantly more resources, since the trips would otherwise be pulling back to the garage.

The frequency change is expected to cause 6 passengers to seek alternate services. This would be offset by approximately 25 new passengers attracted by the span change. It is unclear how many passengers would be attracted by the improved reliability.

The changes will add a 1.3 hours to the vehicle schedule, although it would save .6 hours of pullback time, leading to a net change in 0.7 hours. The changes would also add 6.4 miles of service.

### **Route CT2: Sullivan Square – Ruggles via Kendall**

The Route CT2 is a limited stop Crosstown route that operates between Sullivan Square Station and Ruggles Station via Kendall Square and the Longwood Medical Area. Although this route fails the reliability standard based on the most recent data, reliability improvements were made in Winter 2001 to address these issues.

### **Route CT3: Longwood Medical Area – Andrew via Ruggles**

The Route CT3 provides weekday service between the Longwood Medical Area and Andrew Station via Ruggles Station and the Boston Medical Center. Due to requests for additional service, it is recommended that Andrew-bound service before 2:30 PM and LMA-bound service after 2:30 PM be routed via 1010 Massachusetts Ave. and Newmarket Sq. This is expected to add 2 minutes to the inbound route and 3 minutes outbound. This route extension would provide improved service to commuters at 1010 Massachusetts Ave. from the Orange Line or Commuter Rail at Ruggles Station.

In the afternoon, due to on-going reliability issues, it is recommended that the frequency be modified to every 25 minutes rather than every 20. Although this would eliminate the easy-to-remember clockface headway and would reduce the frequency, it is anticipated that this would improve the route's reliability. An extra trip would be added

at 7:50 PM inbound and 7:20 PM outbound, improving the route from an hourly headway to a 30/35 minute headway.

It is expected that 40 new passengers would be attracted to the new 1010 Massachusetts Ave. service, although 24 existing riders would seek alternate services due to the frequency changes. It is unclear how many riders would be attracted to the route due to the reliability improvement. The schedule change would add 1.7 hours and 19.9 miles to the vehicle schedule.

Several minor schedule adjustments are recommended to improve on-time performance. These changes are not expected to change the schedule frequency.

### **Washington Street Silver Line: Dudley – Downtown Crossing**

The Washington Street Silver Line was introduced in the summer of 2002. Boston's first bus rapid transit (BRT) service, it has a number of features not found on other bus routes. The MBTA has made multiple schedule and service adjustments since starting service. No further adjustments are recommended at this time.

### **Route 1: Dudley – Harvard via Mass. Ave.**

This route provides service between Dudley and Harvard Stations with connections to the Red, Orange, Green, and Silver Lines. Due to crowded conditions observed on weekdays between 7pm and 8pm, it is recommended that the outbound peak period service operate until 8pm rather than 7:15pm. This change will add 2

round trips to the schedule, 2.6 hours of service, and 90 new passengers. Several minor running time changes are recommended on weekdays and weekends to improve the route's on-time performance.

### **Route 3: Boston Marine Industrial Park – Chinatown**

Route 3 is a commuter route that provides weekday service between Chinatown and the Boston Marine Industrial Park. When Phase Two of the Silver Line begins operating between South Station and the BMIP, it is recommended that Route 3 be assumed into the Route 11 schedule. Most passengers use the route to connect between the South Boston Waterfront and the Red Line; these passengers would use the Silver Line instead. A small number of passengers traveling between the South Boston Waterfront and Chinatown would walk to or from the Silver Line at South Station.

### **Route 4: WTC – North Station**

Route 4 is a commuter route providing weekday service between North Station and the South Boston Waterfront. Since this route fails the net cost per passenger standard, it is recommended that the Route 4 be modified to serve South Station and the newly reopened Sleeper St.

16 existing passengers are expected to use alternate services due to the slightly longer headways, and 6 passengers are expected to be deterred by the slightly longer travel times to/from the Seaport District. This loss is expected to be offset by an increase of 65 new boardings due to the new South Station connection. A net 43 new passengers are expected.

With the schedule change, the net cost per passenger would improve to \$4.19, which brings the route into compliance with the cost-per-passenger standard. The route also fails the span of service guideline; however, no change in span is recommended, because this would exacerbate the already high cost per passenger.

### **Route 5: McCormack Housing Development – City Point via Andrew**

Route 5 is a community circulator route that provides weekday transit access to residents of the McCormack Housing Development. The schedule does not comply with the frequency guideline or the span of service guideline, however no change is recommended.

### **Route 6: South Boston Waterfront – Haymarket**

Route 6 is a commuter route that provides weekday service between the North End and the South Boston Waterfront. This route does not meet the span of service standard; however, no span changes are recommended because ridership in the Waterfront area and in the Financial District drops off sharply after 5:30pm.

The majority of Route 6 riders are traveling within the South Boston waterfront or between the South Boston Waterfront and South Station. It is expected that most Route 6 riders will transition to the Silver Line when Phase Two service begins operating, therefore it is recommended that the Route 6 be modified to only operate from Haymarket to South Station. Due to the projected running time and the lighter ridership, it is recommended that the

frequency be modified to operate every 40 minutes rather than 30 minutes. A 40-minute headway does not comply with the MBTA's target peak period frequency for local bus routes; however, the schedule does comply with the frequency requirement of at least three peak period, peak direction trips. Furthermore, the ridership is expected to be extremely light and the route geometry does not permit a 30-minute headway without exacerbating the already poor net cost per passenger.

This route restructuring is expected to shift 223 riders to the Silver Line Phase Two. An additional 14 riders are expected to seek alternate service or walk due to the decreased frequency. This change will reduce the vehicle schedule by 6.0 hours and 68.8 miles. It is recommended that this route be observed for future modification as the ridership patterns change.

### **Route 7: South Boston – Downtown via South Boston Waterfront**

Route 7 provides service six days a week between the residential neighborhoods of South Boston and the Downtown / Financial District area via the South Boston Waterfront. In the peak directions, the route travels directly via the Summer St Bridge. In the off-peak and reverse-peak, the route travels a longer route via Seaport Blvd., the World Trade Center, and the Moakley Federal Courthouse. Some reverse-peak variants also provide service to the Boston Marine Industrial Park and the Harbor Industrial Park.

When Silver Line service begins operating between South Station and the South Boston Waterfront area, several

changes to Route 7 are recommended:

- All service will travel via the Summer St. bridge rather than Northern Ave.
- The BMIP variant will no longer operate.
- Harbor Industrial Park service will not change.

Direct service between South Station and the Courthouse, World Trade Center, and BMIP will be available via the Silver Line. A small number of passengers traveling between the residential neighborhoods of South Boston and the Seaport will be able to walk less than 5 minutes from the Route 7 to their destinations in the Seaport. The change would save approximately 4-8 minutes of round trip vehicle travel time. The time savings would be reinvested into the schedule in the morning and afternoon peak periods to offer more frequent service. During the late morning from 9:30am-noon, it is recommended that the headway be modified from 18 to 25 minutes due to low ridership. It is expected that the frequency changes will attract 72 new riders, but that 63 current passengers will begin using the Silver Line instead. 9 net new weekday passengers are expected.

On Saturdays, the Route 7 fails the net cost per passenger standard and features very light ridership. It is recommended that Saturday service be modified to operate every 40 minutes from 8:00 AM - 6:00 PM rather than every 25 minutes. Service before 8:00 AM and after 6:00 PM would be improved slightly from a bus every 35 minutes to a bus every 30, due to the faster route through the Seaport. It is estimated that the frequency changes would cause 58 Saturday passengers to seek alternate transportation services, and that 25

passengers would use the new Silver Line between South Station and the Waterfront instead of the Route 7. It would allow for 10 hours of service to be reinvested elsewhere in the MBTA bus system and would improve the net cost per passenger from \$5.49 to \$4.48, which would pass the cost standard.

### **Route 8: UMass Boston – Kenmore via JFK/UMass, Dudley**

Route 8 is a local route that provides circumferential service between UMass and Kenmore Station via JFK/UMass Station, the South Bay Center, Newmarket, BU Medical Center, Dudley Station, Ruggles Station, and the Longwood Medical Area. Due to the length of the route and unpredictable traffic, it is especially susceptible to irregular service. As such, this route is an ideal candidate for a trial mid-route timepoint program. MBTA supervision staff at Ruggles Station will monitor Route 8 and hold buses there to prevent early departures. In addition to the new timepoints, running times and allow times will be modified in the morning peak and early afternoon to improve on-time performance. Three hours of service will be added to the morning timetable from 6:30 AM - 9:30 AM to improve reliability with no change in frequency. It is unclear how many riders would be attracted by an improvement in reliability.

In a major route restructuring, the short Route 8 variation, which only runs between Dudley Station and Kenmore Station during peak periods, would be combined with the Route 19 to provide service to Fields Corner, Grove Hall, Dudley Square, Ruggles Station, the Longwood Medical Area, and Kenmore

Square. See Route 19 for more details.

### **Route 9: South Boston – Copley Square via Broadway**

Route 9 is a local route that provides service between Copley Square and South Boston via W Broadway and Broadway Station. Due to heavy crowds observed outbound in the evenings from 7:00 - 8:00 PM, it is recommended that buses operate every 20 minutes rather than 30. This change would add an additional hour of service and 8.3 miles into the schedule. It is expected that the change would attract 32 new riders to the service. This would not affect the net cost per passenger of \$1.31.

### **Route 10: South Boston – Copley Square via Andrew**

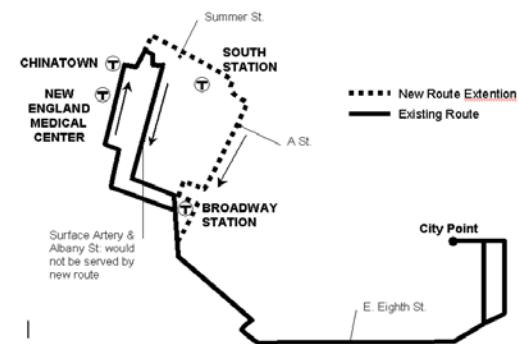
Route 10 is a local route that provides service between Copley Square and the residential areas of South Boston via Back Bay Station, the B.U. Medical Center, and Andrew Station. There have been some reports of poor on-time performance in the outbound direction in the AM peak. Running times should be modified to improve on-time performance, especially in the evenings and in the segment between Copley Square and Back Bay Station.

### **Route 11: Bayview – Downtown via Broadway**

Route 11 provides service between the Bayview area of South Boston and Downtown Boston via Broadway Station and Chinatown. In the current schedule, every other reverse-peak period trip operates as a Route 3 rather than Route 11. When Silver Line Phase Two begins providing service between South Station and the South Boston Waterfront, it is recommended that all Route 3 trips

operate as Route 11 trips instead. This would improve the reverse-peak frequency on Route 11 to a bus every 11 minutes rather than 22. This schedule change is expected to attract 78 new Route 11 passengers, and would add 5.5 hours of service to the timetable.

To replace some of the connections that the Route 3 will no longer make, it is recommended that Route 11 be extended to travel via Chauncy St., Summer St., Melcher St., and A St. when traveling between downtown Boston and Broadway Station. This would allow for better distribution throughout the Financial District, would connect to the Silver Line at South Station, and would provide regular service along A St in South Boston. Since the new route is .8 miles longer per round trip than the existing route, this change would require increasing the interval between trips by 1 minute during peak periods and by 2-3 minutes in the off-peak. Evening and Sunday variants that omit Bedford & Chauncy Sts. would not take the new route, but would continue to terminate at Kneeland St.



### **Route 14: Roslindale Square – Heath Street Loop via Dudley Station**

Route 14 linked Roslindale Square with Dudley Station until the Spring of 2002,

when it was merged with old Route 46 (Dudley Station-Heath Street Loop) to form the present Route 14. Presently, Route 14 operates every 30-35 minutes on weekdays (except late mornings, when the headway is every 45 minutes) and Saturdays.

Given that this change only recently took effect, it is recommended to defer any analysis of this route until relevant data are available and ridership patterns have been given time to evolve.

### **Route 15: St. Peter's Square – Ruggles via Dudley**

Route 15 is a local route connecting St. Peter's Sq. and Kane Sq. with Dudley Station and Ruggles via Uphams Corner. Several minor changes are recommended on weekdays, Saturdays, and Sundays in order to improve the on-time performance.

### **Route 16: Forest Hills – Andrew Station via Uphams Corner**

Route 16 is a local route, which operates between Forest Hills and Andrew Stations via Columbia Rd. and Uphams Corner. Several minor schedule adjustments are recommended to improve the on-time performance.

### **Route 17: Fields Corner – Andrew Station via Kane Square**

Route 17 is a local route that provides service between Fields Corner and Andrew Station via Kane Sq, Uphams Corner, and Edward Everett Sq. Due to poor schedule adherence, several minor running time adjustments are recommended.

### **Route 18: Ashmont – Andrew via Dorchester Ave.**

Route 18 is a local route that operates between Ashmont and Andrew Stations via Dorchester Ave. This route functions as a local distributor, since most long trips in this corridor would be on the Ashmont branch of the Red Line. Several minor schedule adjustments are recommended on weekdays and Saturdays to improve on-time performance. Weekday service does not meet the frequency standard; however, no change is recommended since route only fails from 5:30 PM - 6:30 PM and any change would exacerbate the high net cost per passenger. New Sunday service was added in the winter of 1998; however, this addition fails the net cost per passenger at a subsidy of \$6.64 per passenger. As such, it is recommended that Sunday service no longer operate. It is expected that 91 Sunday passengers (an average of 5.7 passengers per trip) would walk an additional 5-10 minutes and use the Red Line instead.

### **Route 19: Fields Corner – Ruggles via Geneva Ave.**

Route 19 is a local route that operates from Fields Corner to Ruggles via Geneva Ave. and Warren St.

In response to requests for direct service between Roxbury and the Longwood Medical Area, it is recommended that Route 19 be combined with the short Route 8, which operates between Dudley Station and Kenmore Station. The new route would operate Fields Corner - Kenmore Station via Grove Hall, Warren St., Dudley Station, Ruggles Station, and the Longwood Medical Area during rush hours. In the midday, the route would

only operate between Fields corner and Ruggles Station.

In addition to the route extension, this change would improve the frequency as follows:

AM Peak: Was every 15 mins. → Now every 12 mins.

PM Peak: Was every 25 mins. → Now every 20 mins.

It is expected that the improved service frequencies would attract 133 passengers, and an additional 50 riders would be attracted to the new connection between Grove Hall and the LMA. This change is expected to add a half hour and 7.4 miles of service on weekdays.

### **Route 20: Fields Corner-Fields Corner Belt Line**

Route 20 operates daily, as two distinct services with several variations. "Via Adams" buses operate in a counterclockwise loop configuration, "Via Neponset" buses operate in a clockwise loop configuration. Some buses serve retail developments via Victory Road and Freeport Street, and/or the Keystone Apartment complex.

Route 20 experiences schedule adherence problems due to inadequate running times. Minor adjustments should address this. Although it passes net cost per passenger, Route 20 experiences low ridership on weekends, particularly on Sundays (average, about 13 boardings per trip). Given the adequacy of service (bi-directional headways of 17 minutes on Saturdays and 35 minutes on Sundays), it is proposed to extend Route 20 from the Neponset Rotary to the North Quincy Red Line Station on Saturdays from 8AM to 6PM, and on Sundays from 10AM to 5PM. This will

lengthen headways to about 25 and 45 minutes, respectively, but will create a daily North Quincy-Dorchester link (i.e., a link to complement existing weekday-only Route 210 service

In addition, to make Route 20 service easier for customers to understand, it is proposed to redesignate the service as follows:

- Route 201 - Belt Line via Neponset
- Route 202 - Belt Line via Adams
- Route 203 - Fields Corner – North Quincy via Neponset
- Route 204 - Fields Corner – North Quincy via Adams

### **Route 21: Ashmont – Forest Hills**

Route 21 operates daily (Sunday Service was inaugurated in March of 2002).

Route 21 fails weekday schedule adherence. Some running time adjustments of up to 5 minutes in the afternoon and evening are recommended.

Weeknight service ends about 9PM. Ridership remains strong into the evening and additional service to the area is also available from routes 26 and 31, both of which operate for the full span of weekday and Saturday service. Thus, due to resource constraints, added service cannot be considered.

Saturday and Sunday service is to be increased by five round trips (one early AM and four evening) such that the span mirrors the weekday. This is happening as part of mitigation for the recent fare increase and its funding is outside the existing operating budget.

Sunday service fails span service guideline; it both starts too late and ends too early. However, given the presence of routes 26 and 31, and the resource-driven nature of the schedule (one FTE), an added trip is not justified. See Route 26 for a potential mitigation of this.

### **Route 22: Ashmont – Ruggles via Grove Hall**

Route 22 is a local route, which operates from Ashmont Station to Ruggles Station with service to Codman Sq., Talbot Ave., Blue Hill Ave., and Grove Hall. Several minor schedule adjustments have been implemented to improve on-time performance.

### **Route 23: Ashmont – Ruggles via Codman Square**

Route 23 provides local bus service between Ashmont Station and Ruggles Station via Codman Sq, Grove Hall, and Dudley Sq. Several route changes have been made to the route to address reliability problems.

### **Route 26: Ashmont – Norfolk & Morton Belt**

Route 26 operates daily, for the full service day on weekdays and Saturday, and from 9AM-9PM on Sundays.

To maintain continuity of the Route 21 service design, and in recognition of bus-to-bus transfer opportunities, it is recommended to extend Route 26 a short distance, from Norfolk Street to Blue Hill Avenue, to offer transfers to routes 28 and 31 when Route 21 is not operating (i.e., after 9PM every day of the week). This will add a negligible amount of run time, perhaps 3-4 minutes, to each of nine

weekday/Saturday, and three Sunday, trips.

### **Route 24: Wakefield and Truman – Mattapan**

### **Route 27: Ashmont – Mattapan**

### **Route 30: Forest Hills or Roslindale Sq – Mattapan**

These three routes provide hub-and-spoke type service from the Mattapan Trolley and Bus Station. All three have similar spans (approximately full span weekday and Saturday, and 9AM-9PM on Sundays), and all three are interlined with each other at varying times.

All three routes fail schedule adherence standard nearly all the time. However in nearly all cases this is due to early arrivals. The schedule will be adjusted to more accurately reflect the true running time. Route 27 is being changed from a 30-minute headway to a 35-minute headway in the afternoon to allow longer running time in that period.

Routes 24, 27 and 30 can be interlined between 9AM and 1PM on weekdays. This would increase the frequency of route 24, decrease the frequency of route 27, and permit route 30 to run to Forest Hills as it does the rest of the day, instead of running to Ashmont via the 27, without changing the frequency of service. More people ride route 24 than route 27, so this would result in a net gain in passengers and a net loss of customer waiting time, while simplifying and enhancing route 30. The headways would change as follows:

Route 24: Midday service is every 50 mins. → would be 30-45 minutes (30/30/45)

Route 27: Midday service is every 30 mins. → would be 30-45 minutes (30/30/45)

Route 30: No change

Routes 24 and 27 can be interlined before 7PM on Saturdays. This would increase the frequency of route 24 and decrease the frequency of route 27.

More people ride route 24 than route 27, so this would result in a net gain in passengers and a net loss of customer waiting time. The headways would change as follows:

Route 24: Service is every 50 mins. → would be every 40 mins.

Route 27: Service is every 30 mins. → would be every 40 mins.

Additionally, a suggestion was received to add more service to route 30 in the AM Peak. There are not routine crowding problems during this period. Service currently runs every 30 minutes. Service could be increased to every 20 minutes by adding one bus to the AM Peak. This would attract 70 new passengers at a cost of \$240 per weekday, or \$3.43 for each passenger gained. The ridership would change from 1938 to 2008, the cost from \$2701 to \$2941, and the cost per passenger from \$1.39 to \$1.46 (this number does not consider the other changes being made to the route.) It is recommended.

### **Route 28: Mattapan – Ruggles**

Route 28 serves the Blue Hill Avenue corridor. It links the Orange Line, Commuter Rail, Silver Line, and Mattapan Trolley. Service spanning the full service day is provided daily, along with Friday/Saturday Night Owl and early morning job access service. Route 28 serves a highly transit-dependent

population, evidenced by very high weekend ridership.

Although, based on the latest available ridecheck data, Route 28 appears to fail schedule adherence standard daily, most running times have been subsequently adjusted.

### **Route 29: Mattapan – Ruggles; Mattapan – Jackson Square**

Route 29 is essentially two distinct routes. Route “29-5” provides weekday-only service, linking Mattapan Station with the Orange Line at Jackson Square. Like Route 31, it provides a direct service for lower Blue Hill Avenue customers accessing the Orange Line (or an option for those traveling locally). Route “29-0” provides an extended service (to/from Ruggles in lieu of Jackson Square) during weekday and Saturday evenings.

The first AM inbound weekday 29-5 trip exceeds the loading standard and thus an earlier trip is needed. This can be accomplished by transferring resources from the lightly used 9:12AM trip to a new 5:20AM trip.

### **Route 31: Mattapan – Forest Hills**

Route 31 links Mattapan Station with the Orange Line at Forest Hills for the full span of MBTA service.

Route 31 fails schedule adherence standard daily. Minor run time changes are recommended to alleviate this problem.

The first Sunday AM inbound Route 31 trip that departs Mattapan at 6:00AM exceeds the loading standard. To alleviate this crowding a **Route 191**, a

single trip departing Mattapan for Haymarket in the early a.m. should also run on Sundays. As an initial experiment, a new Sunday Route 191 trip should depart Mattapan at 5:20AM, arriving at Haymarket at 6:00AM.

Sunday service on route 31 is every 20 minutes. Running time information indicates that for all or some of the day, route 31 could run every 18 minutes at no additional expense and negligible impact to reliability. Newer data will need to be collected to verify that this change can be done, so its inclusion in this plan is tentative. While service would be more frequent, it would no longer be at a "clockface headway" (6:00, 6:20, 6:40, 7:00, 7:20, 7:40, etc.) in which the whole day's schedule is easy to remember.

### **Route 32: Wolcott Square – Forest Hills**

Route 32 serves the Hyde Park Avenue corridor daily for the full service day. When weekday service is provided, short route trips to Cleary Square ONLY supplement Wolcott Square trips. To address concerns over weekday AM peak period crowding, and to smooth an irregular 10-15-12 headway transition leaving Wolcott Square ~9AM, it is proposed to add one bus to the AM peak 32-0 short route pullout approximately as follows:

Lv Cleary	Ar FHills	Lv FHills	Ar Cleary
657A	712	715	727
732	747	DH	~800
802	817	DH	~830
833	848	DH	~901
902	917		

### **Route 33: River & West Milton Sts – Mattapan Station**

Route 33 links Mattapan Station with Cleary Sq/Hyde Park Ave and residential areas of Dedham and Readville. In the weekday mornings, and all day Saturdays, the Dedham loop is served clockwise. Weekday PMs, it is served counterclockwise.

In the PM the existing, final weekday Route 33 trip departs Mattapan at 6:45PM. It has ridership that is quite low (typical max. load 7); however, customers may avoid this trip for fear of missing the last bus of the night. To increase ridership, it is proposed to add a half-trip, departing Cleary Square at 7:35PM. This trip will connect with a Route 24 bus departing Mattapan at 7:00PM, a Route 32 bus departing Forest Hills at 7:00PM, and the Providence train departing South Station at 6:50PM

The first Saturday trip (Departing Forest Hills at 6:25AM and River Street at 6:45AM) experiences very low ridership. However, the final evening trip accommodates 11 outbound boardings. It is thus proposed for the Saturday schedule to: Cancel the first southbound trip in the morning. To accommodate any Route 33 commuters who may require early AM transportation on Saturdays, the 6:20 AM southbound Route 32 trip should be redirected to Wolcott Square via River and West Milton streets. This will require a new variation of Route 32 and add an additional evening trip departing Mattapan at 7:15PM.

This route also experiences schedule adherence problems that could possibly be addressed by enforcement of on-time departures from Cleary Square.

## **Route 34: Dedham Line – Forest Hills Station**

Route 34 provides local service on Washington Street south of the Forest Hills station. Service is dovetailed, to the extent practical, with Route 34E (Walpole-Forest Hills). Schedule adherence problems due to early arrivals can be largely addressed through on-time departures from Roslindale Square. No structural or scheduling changes are recommended for this route, except for the addition of an 8pm Outbound trip to address crowding on the 8:10pm 34E.

## **Route 34E: Walpole – Forest Hills**

Due to community requests this route was changed in the spring of 2003 to provide a limited amount of service on Walpole Street on weekdays. This service change will continue. The only suggestion to further improve service on this route is to eliminate the stop at the Polaroid Facility due to low/no utilization.

## **Route 35: Dedham Mall – Forest Hills**

## **Route 36: Charles River Loop; or VA Hospital – Forest Hills**

These two routes link Forest Hills and Dedham/West Roxbury via the Belgrade Ave. and Centre Street corridors. Route 36 provides service for the entire service day. Route 35 operates daily, until about 9PM weekdays and Saturdays, and from about 10AM-6PM on Saturdays.

Both routes fail schedule adherence criteria daily, mostly due to early arrivals. On Sundays the first AM inbound trip of the 36 (departing Charles River Loop at 5:55AM) accommodates

an average max. load of 27 customers and is its second most heavily utilized inbound trip of the day. This suggests that an earlier trip may be warranted. It is thus proposed to operate the Monday-Saturday 4:55AM inbound trip on Sundays. Since there is no connecting Orange Line service, this trip should proceed to Mattapan via Route 31, to become the proposed Sunday Route 191 to Haymarket. See the schedule below.

### **Proposed Route 36/31/191 Sunday Sunrise Trip**

Leave Charles River Loop	4:55A
Arrive Forest Hills	5:10
Arrive Mattapan via Route 31	5:21
Arrive Haymarket	6:01

## **Route 37: Baker & Vermont Sts – Forest Hills Station**

This route links West Roxbury with the Forest Hills Station via Belgrade Avenue and Washington Street. During early morning Saturdays, and all day Sundays, service is combined with a portion of Route 38 (i.e., via Centre Street and Faulkner Hospital) to flex some service from Washington Street to this corridor, which would otherwise not be served when Route 38 is not operating.

Schedule adherence problems due to early arrivals can be largely addressed through on-time departures from Roslindale Square. No structural or scheduling changes are recommended for this route.

## **Route 38: Wren Street – Forest Hills Station**

This route links West Roxbury with the Forest Hills Station via Centre Street and Faulkner Hospital. During early morning Saturdays, and all day Sundays, service

is combined with a portion of Route 37 (i.e., Route 38 does not operate as a stand-alone route) to flex some service from Washington Street to this corridor, which would otherwise not be served.

Schedule adherence problems can be largely addressed by adopting an adjustment in the outbound weekday run times. No structural or scheduling changes are recommended for this route. Although the final two trips on weeknights violate frequency guidelines (80 and 120-minute headways), no action is recommended since these trips accommodate only about four-to-six customers in each direction.

### **Route 39: Forest Hills – Back Bay**

Route 39 connects Forest Hills and Copley Square by way of Centre and Huntington streets in Jamaica Plain. At the present time it is anticipated that this route will be operating with 60' CNG buses until streetcar service is restored. Given the use of these vehicles the crowding profile will change compared to what was last measured on 40' buses. At the present time the only recommendation to further improve service along this corridor would be to change the Outbound 4:53pm trip so that it starts at Longwood Medical Area at 5:07. (It would still reach Forest Hills at 5:28.) This would attract the many people who leave the Longwood Medical Area at 5:00 to this trip, which would have a positive impact on crowding and bunching. This would be a benefit not just for LMA workers but anyone who uses the route in the PM peak. The cost savings and new ridership would be negligible, but both impacts would be positive, so this change is recommended.

### **Route 40: Georgetowne – Forest Hills**

### **Route 50: Cleary Square – Forest Hills**

The introduction of Sunday service in a loop configuration is suggested. Buses will travel away from Forest Hills on one route and back to Forest Hills on the other.

### **Route 41: Centre and Eliot Streets/JP Monument – JFK U Mass Station**

This route linked the Jamaica Plain area with Dudley Station until the Spring of 2002, when it was extended to JFK/U Mass Station and all-new Sunday service was inaugurated.

Given that this change only recently took effect, it is recommended to defer any analysis of this route until relevant data are available and ridership patterns have been given time to evolve.

### **Route 42: Forest Hills – Ruggles**

With the introduction of the Silver Line, many bus passengers are no longer riding through to the Orange line between Dudley and Ruggles. Given this, the current level of service that is provided along the corridor between Dudley and Ruggles is no longer needed and it is recommended to truncate all Route 42 weekday and Saturday service at Dudley. Sunday service on Route 42, when service levels of the bus routes serving the area are lower, would continue through to Ruggles.

### **Route 43: Ruggles – Park Street via Tremont**

Route 43 provides local service between Ruggles Station and Park St. Station via

Tremont St. in the Back Bay. From 1997 to 2001, weekday ridership dropped 29% from 3,741 passenger boardings to 2,648 passenger boardings. The average number of passengers per trip dropped from 21.0 to 15.4, a decrease of 26.7%. As such, the following frequency modifications are recommended:

- Early AM 5:30AM – 6:30 AM was every 15 mins. → would be every 20 mins.
- School 1:30 PM – 3:30 PM was every 12 mins. → would be every 15 mins.
- PM Peak 3:30 PM – 6:30 PM was every 10 mins. → would be every 12 mins.
- Late Evening 9:00 PM – 11:30 PM was every 20 mins. → would be every 35 mins.

It is expected that there would be 119 fewer passenger boardings with the changes in frequency. This would allow 6.8 service hours to be reinvested elsewhere in the MBTA bus network.

#### **Route 44: Jackson Sq. Station – Ruggles Station**

Route 44 provides local service between Jackson Sq. Station and Ruggles Station via Humboldt Ave. and Dudley Sq. Several modifications have been implemented to improve on-time performance.

#### **Route 45: Franklin Park – Ruggles via Blue Hill Ave.**

Route 45 provides local service along Blue Hill Ave between Franklin Park and Ruggles Station. Due to schedule adherence problems during peak periods, several minor schedule adjustments are recommended. Most adjustments would not change the frequency. One proposal

would change the PM peak frequency 4:00 PM - 6:00 PM to a bus every 9 minutes rather than every 8 or 9. Approximately 9 fewer passengers would ride during the PM peak due to the frequency change, although some of these passengers may be retained due to the reliability improvement. Similarly, on Sundays from 1:00 PM to 4:00 PM it is recommended that the bus arrive every 50 minutes rather than 45 to improve the reliability. It is estimated that up to 13 fewer passengers would ride the service due to the frequency change. This change would also extend the span of service 30 minutes later so that the last Sunday trips would operate at 11:30 PM inbound and 12:00 AM midnight outbound, rather than the current last trips at 11:00 PM inbound and 11:25 PM outbound.

#### **Route 47: Broadway – Central Square via BUMC, Dudley**

Route 47 provides daily circumferential service between Broadway Station and Central Square, Cambridge via the Boston Medical Center, Dudley Station, Ruggles Station, and the Longwood Medical Area. Since the Route 47 buses spend a significant amount of time on roads with unpredictable traffic speeds, this route is especially unreliable. As such, this route is another ideal candidate for a trial mid-route timepoint program. MBTA supervision staff at Ruggles Station will monitor Route 47 and hold buses there to prevent early departures. In conjunction with holding at Ruggles, the running times will be modified to improve on-time performance.

#### **Route 48: Jamaica Plain Loop**

This community circulator route serves the Jamaica Plain commercial and

residential areas weekdays and Saturdays. It links the JP Monument with the Orange Line via local streets.

No structural or scheduling changes are recommended for this route. Boardings average fewer than five customers per trip, and the recently-adjusted run time addressed schedule adherence problems.

### **Route 51: Forest Hills – Cleveland Circle**

Route 51 is a local route that provides service between the Forest Hills station on the Orange line and Cleveland Circle, on the Green Line. This route fails the schedule adherence standard, and will continue to be monitored for improvements in running times. Due in large part to the demand from the students utilizing this service, it is suggested that this route be improved by adding one weekday early AM trip. It is projected that even with the additional trip this route will continue to meet the net cost per passenger standard.

### **Route 52: Dedham Mall – Watertown Yard**

This route links several bus corridors and the Green Line Newton Centre station with largely residential areas of Newton and West Roxbury.

No structural or scheduling changes are recommended for this route. Weekday schedule adherence problems due to early arrivals can be largely addressed through on-time departures from the Newton Centre Station. Although Saturday service violates frequency guidelines (70 to 90-minute headways), no action is recommended since these

trips accommodate only about seven customers in each direction.

### **Route 55: Fenway – Park Street via Copley**

Route 55 is a local route that provides service between the Fenway neighborhoods and the Green Line, either at Copley Square or Park St. Station. Due to the high cost per passenger and the light utilization of late evening trips, it is recommended that service after 9pm be discontinued. The last 6 inbound trips and 7 outbound trips average 1.2 passengers each (16 passengers total) on weekdays, 1.6 passengers each (21 passengers total) on Saturdays, and 2.5 each (32 passengers total) on Sundays. These passengers could walk less than a quarter mile between the Fenway area and bus service along Brookline Ave. Travelers also could walk between the Fenway area and the Green Line at Fenway or Kenmore Stations.

### **Route 57: Watertown – Kenmore via Oak Square**

Route 57 provides service between Watertown and Kenmore Station via Oak Square, Brighton Center, and Union Square in Allston. Several minor schedule adjustments are also recommended to improve schedule adherence. To address crowding on Sundays, which fails the Service Delivery Policy guidelines, it is recommended that service be increased from 11:00 AM - 7:00 PM. This would improve the frequency from every 15 minutes to every 12 minutes instead. This frequency improvement is expected to attract 250 new Sunday riders.

### **Route 59: Needham Junction – Watertown Square via Newton**

Route 59 provides weekday and Saturday service between Needham Junction and Watertown Square via Newton Highlands and Newtonville. On Saturdays, the route fails the cost per passenger standard and has low ridership with 11.5 passengers per trip. It is recommended that Saturday service be modified to operate every 75-90 minutes rather than 45 due to the high cost per passenger. 12.8 hours of service would be reinvested from the Saturday schedule to begin operating new Sunday service. It is expected that 94 fewer Saturday passengers would ride the route due to the frequency change, but that 200 new Sunday passengers would begin riding the route. This change would improve the net cost per passenger from \$5.50 to \$3.69. Several other minor schedule adjustments are recommended to improve on-time performance.

### **Route 60: Chestnut Hill – Kenmore Square via Boylston St.**

Route 60 provides service between Chestnut Hill and Kenmore Square via Boylston St. in Brookline and via Brookline Ave in Boston. Due to the high net cost per passenger on Sundays, it is recommended that the last trip in each direction, which averaged 1 passenger each, no longer operate. This would trim an hour from the Sunday schedule. Also, several minor schedule adjustments would be implemented to improve the on-time performance.

### **Route 62: Bedford V.A. Hospital – Alewife via Arlington**

This route connects the Bedford V.A. Hospital with Mass. Ave in Lexington

and Arlington, Arlington Heights, Route 2 and Alewife Station. This route failed the span of service guideline because the first Inbound trip arrives at Alewife at 7:10 AM instead of at or before 7:00AM. To change the schedule accordingly, maintain the current headways and maintain the current interlining with Route 76 (giving customers traveling between Alewife and Lexington Center frequent service), it would be necessary to move all trips on route 62 and Route 76 10 minutes earlier between the start of service and 3:50 PM. Given that Route 76 overlaps significantly with Route 62 and arrives at Alewife before 7AM, and given that there is no evidence of demand for this change, it is not recommended. Route 62 failed the schedule adherence standard in part because some of its PM peak Inbound trips have trouble leaving on time. It is recommended that schedules be adjusted to offset the early arrivals, running time be given to recovery time. Schedule adjustments have been made for the Spring of 2004 addressing this issue.

### **Route 62/76: Bedford V.A.**

#### **Hospital – Alewife via Hanscom**

This route is a hybrid of Routes 62 and 76 operating on Saturdays, when there is not enough demand to justify running the routes separately, but there is too much demand to eliminate them. Route 62/76 connects the Bedford V.A. Hospital with Hanscom Air Force Base and Hanscom Air Field in Lexington, Mass. Ave in Lexington and Arlington, Arlington Heights, Route 2 and Alewife Station. Route 62/76 failed the on-time performance standard; however, as this data is from 1997/1998, it is recommended that no change be made until a new ride check can be performed.

### **Route 64: Oak Square – Central Square**

This route connects Oak Square in Brighton with Beacon and Cambridge Streets; Central Square, Cambridge; and Kendall or University Park depending on time of day. This route fails the schedule adherence standard on weekdays for two reasons: 1) late Inbound service in the AM peak; and 2) late Outbound service in the PM peak. In the AM peak, Route 64 appears to need about 8 more minutes of Inbound running time between 7am and 8:30am, and 3-4 minutes of recovery time shifted from the Oak Square end to Kendall. To allow for this the headway would need to be changed from 20 to 23 minutes. This headway change would result in the loss of 14 riders but service reliability would be improved. This change is not expected to cause crowding problems. In the PM peak, the route appears to need about 17 more minutes in the Outbound direction. To allow for this and a corresponding adjustment to recovery time, the headway would need to be changed from 20 to 25 minutes in the PM peak. This headway change would result in the loss of 24 riders, but service reliability would be improved. This change is not expected to cause crowding problems.

A suggestion was received to add more frequent service after 7:30PM. By adding two round trips in the following two hours, service could be improved from one bus every 60 minutes to one bus every 30 minutes. This would attract an estimated 25 new riders at a cost of \$161 (or \$6.44 per new passenger.) This is recommended.

### **Route 65: Brighton Center – Kenmore via Brookline**

Route 65 provides weekday and Saturday service between Brighton Center and Kenmore Station via Brookline Village and the Longwood Medical Area.

Schedule adherence and crowding were identified as problems during the AM and PM peak periods. Modifications from Fall 2003 and Spring 2004 are expected to have addressed these issues.

On Saturdays, the route fails the net cost per passenger standard. Over the entire service day from 6:45 AM until 6:35 PM, the route averages 7 passengers per trip. It is recommended that the schedule be modified to operate hourly rather than every 30 minutes. This change would reinvest 7 hours of service elsewhere in the system, although approximately 52 fewer passengers would ride Route 65 on Saturdays due to the frequency change. This would reduce the net cost per passenger from \$4.99 to \$3.73.

### **Route 66: Harvard – Dudley via Allston**

Route 66 provides circumferential service between Dudley and Harvard Stations via Brookline Village and Union Sq, Allston. Schedule adherence was observed to be problematic in the AM Peak and in the late morning. Modifications from Fall 2003 are expected to have addressed this issue.

### **Route 67: Turkey Hill – Alewife via Arlington Center**

This route connects Turkey Hill, the Arlington Symmes / Lahey Clinic site, and Arlington Center to Alewife station.

Ridership at the Lahey Clinic site is very light as the site is in a transitional state, and it could be cut out of the trip; however, development is planned in the area soon, and ridership there should improve when that occurs, so service should remain. The route fails the schedule standard mostly due to early Inbound trips departing between 9am and 5:31 pm. It is recommended that the scheduled running time be shortened by 3 minutes during that period.

### **Route 68: Harvard – Kendall via Broadway**

This route connects Harvard, Union and Kendall Squares along Broadway in Cambridge. When last checked, it passed every service standard. Changes are proposed to the schedule between 10AM and 2PM, during which time there is an average of just 2 boardings on every trip. The service standard for a local route on the midday dictates that service be at least every hour, more frequent as demand and passenger loads dictate. 4 customers an hour does not call for service more often than every hour. Therefore this change would reduce the headway from 30 minutes to 70 minutes for that time, at a cost of 12 customers and a savings of \$160 every weekday. This change is dependant on changes to route 85, but the cost and savings has been calculated separately for each route. This change is recommended.

### **Route 69: Lechmere – Harvard**

This route connects Harvard, Inman Square and Lechmere along Cambridge Street. The route failed the schedule adherence standard on weekdays, in part due to numerous early Inbound arrivals in the evening. This could be addressed

by changing the scheduled running time from 14 to 13 minutes between 5:55 PM and 8:30PM and from 13 to 11 minutes from 8:30PM until the end of service. The savings would then be added to the recovery time. This change is recommended but will not result in any cost savings.

The route failed the schedule adherence standard for Sundays due to early Inbound trips before 10:30AM and after 9:30 PM. It is recommended that the Inbound running time be reduced from 13 to 10 minutes during that period. This time can be used for the recovery time. No cost or ridership changes are expected from this adjustment.

### **Routes 70 and 70A: Waltham–Central Square**

Routes 70 and 70A connect Central Square, Waltham to Watertown Square, the Arsenal Mall and Central Square, Cambridge by way of Main Street, Arsenal Street and Western Ave. Route 70 also serves Cedarwood, and route 70A also serves North Waltham.

Routes 70 and 70A both fail the schedule adherence and loading standards on weekdays. (Route 70A also fails the frequency guideline, but no action is recommended given that it mostly overlaps route 70.) The loading problem appears to stem from the way the schedules of the 70 and 70A combine, and not from a need for more service on the routes. It is recommended that a new schedule be created, making some running time adjustments and with an effort to keep the headways along the shared portion of the route as even as possible.

### **Route 71: Watertown Square – Harvard via Mount Auburn St.**

This route is a Trackless Trolley (electric bus) route connecting Watertown Square and Mount Auburn Street in Watertown to the Mount Auburn Hospital and Harvard. Route 71 fails the schedule adherence standard on weekdays, in part because of a number of early Outbound trips in the morning, early inbound trips in the late morning through the PM peak, and evening Inbound trips pulling back to the garage. It is recommended that:

- Between the start of service and 6:59 AM, change the scheduled Outbound running time from 17 minutes to 14 minutes
- Between the start of service and 6:59AM, change the scheduled Outbound running time from 25 minutes to 22 minutes
- Between 10AM and 12:59 PM, change the scheduled Inbound running time from 24 minutes to 20 minutes
- Between 1PM and 2:59 PM, change the scheduled Inbound running time from 25 minutes to 21 minutes
- Between 3PM and 6:59pm, change the scheduled Inbound running time from 26 minutes to 22 minutes
- Between 7 PM and the end of service, change the scheduled Inbound running time of trips heading to North Cambridge from 22 minutes to 27 minutes

It is further recommended that the headway be changed from 7 to 8 minutes between 6 and 7AM, for a savings of \$72/day and a loss of 5 passengers.

This route fails the schedule adherence standard on Sundays in part because six Outbound trips left Harvard one or two

minutes early. This presents a problem, because the end of the Inbound trip and the start of the Outbound trip is the same for route 71 on Sundays. Drivers are not able to hold their time just before the Harvard tunnel because their bus is carrying passengers, and they are not able to hold their time in the Harvard tunnel as they would block other buses. It is recommended that the Inbound scheduled running time be reduced by 1-2 minutes, and that time given to the Outbound running time, to prevent trips from leaving early.

### **Route 72: Aberdeen Ave – Harvard Square**

This route connects Aberdeen and Huron avenues in Cambridge to Concord Ave and Harvard Square. It failed the schedule adherence standard on weekdays because inbound trips departing before 7am and Outbound trips departing before 2pm were consistently early. It is recommended that the Inbound running time be reduced from 11 to 9 minutes before 7am and that the Outbound running time be reduced from 11 to 10 minutes before 7am, and from 12 to 11 minutes before 2pm.

### **Route 72/75: Belmont – Harvard**

This route is a hybrid of routes 72 and 75 operating on Saturday evenings and Sundays, when there is not enough demand to justify running the routes separately, but there is too much demand to eliminate them. It connects Belmont Center and points in Belmont and Cambridge south of Fresh Pond to Harvard Station. Route 78 maintains service along Concord Ave between Sancta Maria Hospital and Harvard Square; however, as noted by some patrons the connection between Belmont

Center and the hospital does not exist when this service is operating. Due to the low level of usage on that portion of the route compared to the benefit of combining the two services, it is recommended that this service remain in its current configuration.

### **Route 73: Waverley – Harvard via Mount Auburn**

This route connects Waverley Square to Cushing Square, Belmont Street, Mount Auburn Hospital and the Red Line.

Route 73 fails the schedule adherence standard on Sundays in part because six Outbound trips left Harvard one or two minutes early. This presents a problem, because the end of the Inbound trip and the start of the Outbound trip is the same for route 73 on Sundays. Drivers are not able to hold their time just before the Harvard tunnel because their bus is filled with passengers, and they are not able to hold their time in the Harvard tunnel as they would block other buses. It is recommended that the Inbound scheduled running time be reduced by 1-2 minutes, and that time given to the Outbound running time, to prevent trips from leaving early.

### **Route 74: Belmont Center – Harvard**

This route connects Belmont Center and points in Belmont and Cambridge north of Fresh Pond to Harvard Station. It failed the schedule adherence standard when it was last checked on weekdays and Saturdays, but because roadwork may have caused some problems with earlier counts, it is recommended that no action be taken in this regard until additional data are available.

### **Route 75: Belmont Center – Harvard**

This route connects Belmont Center and points in Belmont and Cambridge south of Fresh Pond to Harvard Station.

This route failed the span of service guideline on weekdays, because its first trip arrives at Harvard at 7:19 AM. It failed the frequency guideline on weekdays, because it runs roughly every 50 minutes in the AM peak and every hour in the PM peak, and it failed the frequency guideline on Saturdays, because its morning service averages a 70 minute headway. However, Route 75 is essentially a variant of Route 74, and the shared portion of the routes meets the guidelines.

### **Route 76: Hanscom – Alewife via Arlington**

This route connects Hanscom Air Force Base and the Civil Air Field in Lexington, Mass. Ave in Lexington and Arlington, Arlington Heights, route 2 and Alewife Station. It fails the cost standard. This route used to run through the base to the airfield until 2001, when security concerns prevented the route from carrying passengers through the base to the other side. The route currently serves the eastern edge of the base at Lincoln Labs, and goes around the base to serve the airfield. It serves the airfield on the Inbound trips in the AM and on the Outbound trips in the PM. Passengers traveling from Alewife to the airfield in the AM or in the reverse direction in the PM must wait through the layover at Lincoln Labs. This configuration has prompted complaints from commuters to the air field who must wait through two layovers each day and face unpredictable arrival times in

the PM. It has also prompted complaints from residents just east of the base who must wait through a diversion to the airfield on their Inbound trip in the morning and again on the Outbound trip in the evening. Recently the Air Force Base has asked the MBTA to return to the base, but to do so without bringing passengers onto the base unless the base is their destination, for security reasons.

It is proposed that the AM/PM configuration be dropped, and instead that half of all round trips enter the Air Force Base but do not go to the Civil Air Field, and that half of all trips do not go to the Air Force Base but do go to the Civil Air Field on the way to Alewife. These two variants would alternate throughout the day and be identified as 76B (for "Base") and 76C (for "Civil.") This would return service to the base, where it can attract more customers and help the route pass the cost standard. It would distribute the inconvenience of riding through the field diversion evenly among passengers commuting to and from Lexington. It would improve the reliability of departures from the Civil Air Field and make commuters to the Field wait through one layover instead of two. It would reduce the number of trips to the Field, but this is appropriate for an 8-minute diversion that serves 10-12 people a day. Finally, it can be done within existing resources. (As passengers can not be brought through the base on their way elsewhere, the only way to serve both the field and the inside of the base on every trip would be to take at eight-minute diversion to the field on the trip from Alewife and again on the return trip. This could not be done without increasing the cost per round trip, very inadvisable at a time when the route fails the cost standard.) This change is expected to add about 20

passengers at negligible cost and is recommended.

Route 76 failed the schedule adherence standard when it was last checked on weekdays and Saturdays; however, the route has changed significantly since then and is about to change more. Therefore, it is recommended that no action be taken in this regard until additional data are available.

## **Route 77/77A: Arlington Heights – Harvard via Mass. Ave.**

Route 77 connects Arlington Heights, Arlington Center, North Cambridge, Porter Square and Harvard Square all along Mass. Ave. Route 77A runs from North Cambridge to Harvard. Route 77A is a Trackless Trolley (electric bus) route which serves to supplement route 77 and to move the electric buses between their garage in North Cambridge and the start of their routes in Harvard Square. In the morning peak, Inbound route 77 buses do not pick up passengers between North Cambridge and Harvard, but Route 77A, operating just as frequently, does.

Route 77A's supplement to route 77 in the AM Peak is not a good use of resources. The average peak load on a 77A is 8 people, and customers complain that they are passed by Route 77 "Limited" buses. Provided that a 7:32 AM inbound trip on 77A remains in place during the school year, this change would not cause crowding problems on the 77. If route 77A's supplemental AM Peak service is eliminated and route 77 turned into a local route all day, it would represent an improvement in customer service and an opportunity for the agency to use the service elsewhere. This change is recommended.

Running the Inbound 77 (but not the 77A) one stop past the Harvard busway to Eliot and Mount Auburn would not add any running time to the route, since the bus must go there to turn around anyway, and would provide a better transfer from the 77 to the 66. This change is recommended.

A request was received to increase the frequency of service on route 77 on Sundays. It is proposed that a bus be added from 9:00AM to 5:30PM. The frequency of service between 9:00AM and 12:00 noon would increase from a headway of 20 minutes to a headway of 15 minutes, and the frequency of service between 12:00 noon and 5:30 PM noon would increase from a headway of 15 minutes to a headway of 12 minutes. This would attract 225 new riders at a net cost of \$604 (or \$2.67 per new rider), changing the route's efficiency from a cost per passenger of \$1.46 to \$1.54.

### **Route 78: Arlmont – Harvard via Blanchard**

This route connects Arlmont Village, Arlington Heights, Park Circle and points along Blanchard Road and Concord Ave to Harvard Square.

Some minor adjustments in running time may be needed to more accurately reflect operating conditions.

### **Route 79: Arlington Heights – Alewife**

This route connects Arlington Heights and Arlington Center to Alewife Station. The 79 could be better scheduled in coordination with the 77, to minimize waiting time for a Red Line – bound bus from Arlington. The buses had been scheduled in pairs, with route 79

departing just before route 77, to funnel as many passengers to the 79 as possible and minimize crowding on the 77. However they are scheduled so close together that they encourage bunching, and passengers sometimes let the 79 pass them to board the 77, defeating the purpose. This recommended change is not expected to have any impact on cost or ridership.

### **Route 80: Arlington Center – Lechmere via Powder House Square**

This is a local route connecting Arlington Center, Medford Hillside, Powder House Square, Magoun Square, Gilman Square and Lechmere Station. This route passed all but the schedule adherence standard.

### **Route 83: North Cambridge – Central Square via Porter**

This is a local route connecting Russell Field, Rindle Ave, North Cambridge, Porter Square, Inman Square, and Central Square. Although some routing options had been considered in the past, due to a possible relocation of the terminus at Rindle Avenue, those concepts are now not being considered since the turnaround loop at Russell Field is to return after construction at the field is complete. This route passed all but the schedule adherence standard.

### **Route 84: Arlmont – Alewife**

This local route connects Arlmont Village, Park Circle and Alewife Station. Route 84 fails the schedule adherence standard on weekdays. However, it only failed by one trip, and its schedule has

been changed since the last check in Fall 2001.

A suggestion was received to reduce the number of trips on route 84 in the PM Peak. Currently, two vehicles run with ones trip every 17 minutes. This could be reduced to one vehicle every 30-35 minutes, and the span of service could be extended to include a 6:45 outbound trip. This would cause the MBTA to lose approximately 18 passenger-trips. (23 lost to headway change, 5 gained from span change.) The net cost of the route would change from \$725.53 to \$543, the cost per passenger would change from \$3.28 to \$2.67, and the MBTA would save \$10 per passenger lost. The new route would fail the headway standard in the PM Peak, but only by five minutes and only by two trips.

### **Route 85: Spring Hill – Kendall/MIT**

Route 85 is a local route connecting Spring Hill, Summer Street, Union Square and Kendall/MIT. Since the extension of CT2 to Sullivan, much of Route 85 has become redundant, but it has a strong following among Spring Hill residents. The route has strong peak-period ridership and weak off-peak ridership.

Between 10AM and 2PM on weekdays, the average trip on route 85 carries an average of 4 people. Therefore it is proposed that headway be reduced from 40 minutes to 70 minutes for that time, at a cost of 9 customers and a savings of \$166 every weekday. This change is dependant on a service change to route 68 that would allow the two routes to be interlined, however the cost and savings has been calculated separately for each route.

The MBTA has received several requests for later service on route 85. The last trip of the day usually carries at least 25 people, indicating a demand for later service. Two round trips are to be added to the end of service on route 85, leaving Kendall at 7:05 and 7:35. This would add an estimated 12 riders and a cost of \$85 to the route.

In summary, these changes will attract about 3 new riders and save \$85 every weekday. They are recommended.

### **Route 86: Sullivan –Reservoir (Cleveland Circle) via Harvard**

This connects Sullivan Square to Union Square, Harvard Square, Allston, Brighton and Cleveland Circle. It has schedule adherence problems that are a significant source of customer complaints. These complaints can be broken down into two causes: 1) the route starting its trip late because it becomes increasingly delayed throughout the day; and 2) the route leaving from Harvard Square at unpredictable times. The frequent congestion and the fact that the route's biggest destination is in the middle are at the heart of these problems. Route 86 is the only route that goes through Harvard Square, instead of beginning or ending there, and only 10-15% of riders go through Harvard. For reliability it is recommended that Route 86 be split into two routes at Harvard Square. These routes would operate at the same frequency at all times of day. They would be interlined, so customers riding through Harvard Square would find it easy to continue doing so. The bus would arrive at Harvard Square as one route, remain there for about three minutes for assure schedule adherence, and then continue on as the next route.

A passenger could simply wait on the bus.

There have also been requests for later Sunday service. Currently Route 86 service stops at 7 PM on Sundays. A recent ride check showed that demand did not taper off much at the end of service, with the last three round trips averaging 40 passengers each. It is recommended that service be extended by two hours, with two buses at a 40 minute headway.

This change would add about 4 hours of in-service time on Weekdays, 3 on Saturdays, and 7.3 on Sundays. It is expected to add 55 new riders on weekdays, 70 on Saturdays and 127 on Sundays.

### **Route 87: Arlington Center – Lechmere via Davis, Union Square**

This route connects Arlington Center, Clarendon Hill, Davis Square, Union Square and Lechemere Station along Broadway, Elm Street and Somerville Ave.

Route 87 does not serve Arlington Center early morning or late evening on weekdays, or at all on Saturdays or Sundays. A request was received to serve Arlington Center all day every day. Analysis showed that on weekdays, extending the route by two trips would add 12 riders at a cost of \$61/ day. Adding service to Arlington Center on Saturday for the same period of time as weekdays would add 375 riders at a cost of \$760/ day. These changes are recommended. Adding service on Sunday would produce far fewer riders and is not recommended.

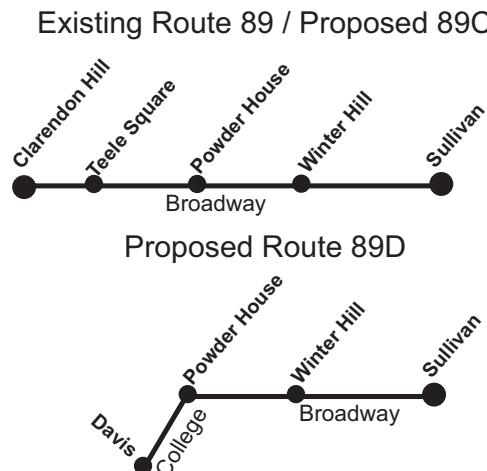
### **Route 88: Clarendon Hill – Lechmere via Davis**

This route connects Clarendon Hill, Davis Square, Somerville High School and Lechmere Station along Broadway, Holland and Highland. Route 88 failed schedule adherence on Sundays when it was last checked in 2002, and its schedule has since been adjusted.

### **Route 89 Clarendon Hill – Sullivan Station**

Route 89 connects Clarendon Hill and Sullivan Station via Powder House Square and Winter Hill.

One frequent comment from residents of the Winter Hill area is that it is difficult to get to points along the Red Line. Connecting route 89 to Davis Square would offer significant improvements in mobility, although the street network makes this complicated. One suggestion received would be to come from Sullivan on Broadway, turn left onto College Ave at Powder House Square, and end the route at Davis. It is proposed that every other trip take this route on weekdays and Saturdays until 7pm, and that remaining trips serve Clarendon Hill as they do now. Davis trips would be known as 89D, and Clarendon Hill trips would be 89C. This would cost the route an estimated 125 riders between Powder House and Clarendon, and attract an estimated 350 weekday riders with Davis Square service for a net gain of 225 weekday riders. There would be negligible cost savings due to the shorter length. The service could be further adjusted in the future once fore ridership numbers are known.



Although this route technically fails the Vehicle Load standard on Sundays, no action is recommended, as the failure occurred due to only one observed trip with three standees. Schedule Adherence on Sunday will be improved through minor changes to running time.

### **Route 91: Sullivan Sq. Station – Central Sq. Cambridge**

Route 91 connects Sullivan Square with Central Square (Cambridge) via Union Square and Inman Square. Existing weekday Schedule Adherence problem was fixed for the Fall 2003 by adjusting the running times. This was done as a minor change that did not increase the cost of operating the route.

### **Route 92: Assembly Sq. Mall – Downtown via Main St.**

Route 92 provides service between Assembly Square Mall in Somerville and Downtown Crossing (Franklin & Arch Streets) via Sullivan Square and City Square in Charlestown. Weekday adjustments were made for the Fall 2003 to alleviate Schedule Adherence problems. This was done as a minor change that did not increase the cost of operating the route.

### **Route 93: Sullivan Sq. Station – Downtown via Bunker Hill St.**

Route 93 provides service between Sullivan Station in Charlestown and Downtown Crossing (Franklin & Arch Streets). In Charlestown, Route 93 operates on Bunker Hill Street and provides some trips throughout the day to the Charlestown Navy Yard. Although Route 93 failed the weekday load standard, new data will soon be available for analysis and will give a better picture of the performance of this route. If changes are still necessary to correct passenger loading and/or schedule adherence problems, they will be made in the near future.

In response to customer requests, inbound trips at 5:30, 6:00 and 6:15 AM on Route 93 will be extended to Downtown Crossing via Post Office Square beginning in the summer 2004. This can be done within existing operating costs.

A request was also made to provide improved access to Medford Street. To do so, the Route 93 schedule will be adjusted so that the following trips will operate between Sullivan Sq. and the Navy Yard via Medford Street instead of Bunker Hill Street:

<b>Outbound Departing Downtown at:</b>	<b>Inbound Departing Sullivan at:</b>
7:44 AM	9:00 AM
7:54 AM	4:08 PM
8:34 AM	4:29 PM
8:46 AM	4:57 PM
6:05 PM	5:32 PM
	6:00 PM

These changes can also be made without incurring additional operating costs. Route 93 trips remaining on Bunker Hill Street during these hours will continue to

provide frequent service; therefore, the change should have a minimal effect on existing riders.

### **Route 94: Medford Square – Davis Square Station**

### **Route 96: Medford Square – Harvard Station via George St.**

Route 94 provides service from Medford Square via West Medford to Davis Square in Cambridge. Many Route 94 trips are interlined with Route 96, which operates between Medford Square and Harvard Station via Davis and Porter Squares. Therefore, any problems on, or changes to, one route affect the other.

Minor changes have been made to correct Schedule Adherence problems on both of these routes during the weekday AM peak period and to improve on-time performance throughout the remainder of the day. These changes did not increase the cost of operating the routes.

### **Route 97: Malden Center Station – Wellington Station**

Route 97 operates between Malden Station and Wellington Station via Everett Square and the Gateway Center in Everett. Running time has been added to this route to correct weekday Schedule Adherence problems.

Although this route failed the Span of Service guideline for Saturday, no action is recommended, due to low demonstrated demand for earlier service.

### **Route 100: Elm Street – Wellington Sta. via Fellsway**

Route 100 provides service through Medford, primarily along the Fellsway, from Elm Street to Wellington Station. Running times and headways have been adjusted on this route to correct weekday Schedule Adherence problems.

### **Route 101: Malden Center Station – Sullivan Square Station**

Route 101 connects Malden Center to Sullivan Square Station via Medford Square and Winter Hill, with some short trips operating only between Sullivan and Medford. To improve weekday schedule adherence, running time was added to some midday outbound trips in Summer 2003. Although this route technically failed the Frequency of Service guideline on Sunday, no action is recommended, as the failure occurred due to one headway during the whole day that was 10-minutes longer than the prescribed 60-minute standard.

### **Route 104: Malden Center Station – Sullivan Station**

Route 104 provides service between Malden Center Station and Sullivan Square via Glendale and Everett Squares in Everett, traveling primarily on Ferry St. and Broadway. A number of minor running time and headway adjustments have been made to this route to improve Weekday, Saturday and Sunday Schedule Adherence problems.

Although this route technically fails the Load standard on Saturday, no action is recommended as the failure occurred due to only one observed outbound trip with three standees.

### **Route 105: Malden Center Station – Sullivan Sq. Station**

Route 105 operates from Malden Center Station, looping east in Malden, then traveling south via Main St and Broadway through Everett to Sullivan Square in Charlestown. This route fails the Frequency of Service standard midday on Weekdays (with 70-minute

headways) and in the PM on Saturday (with 75-minute headways). Because the ridership on this route is not heavy and reducing the headways would require additional resources, no change is recommended at this time.

Route 105 also fails Schedule Adherence Weekdays, Saturday and Sunday. Due to the age of the data for weekend service, no changes are being recommended at this time, pending collection of new data. New weekday data is, however, now available. Based on this data, minor changes will be made to the schedule to correct running times, which should alleviate schedule adherence problems.

### **Route 106: Lebanon St. Malden – Wellington Station**

Route 106 provides all day service from the Lebanon Loop to Wellington Station via Malden Station. Midday service also operates beyond the Lebanon Loop to Franklin Square. Beginning in Summer 2003, this midday service was rerouted at the request of the City of Melrose. As a result of this change, the Route 106 midday service was diverted from Lebanon Street in Melrose onto Park Street, Linwood Avenue and Lynde Street, replacing the midday Route 130 service. From Lynde Street, Route 106 now continues via Grove and Main Streets to Franklin Square. Additional running time was added and the headways were stretched to improve schedule adherence on this route.

As is discussed later in this Service Plan, it is being recommended that Route 130 be eliminated, due to its poor performance on the Net Cost/Passenger standard. Some weekday peak hour Route 106 trips will be extended up

Linwood to Lynde Street, to compensate for the loss of Route 130 service (see Route 130 for map).

Although Route 106 technically fails the Frequency of Service guideline on Sundays, no action is recommended as the failure is due to one inbound and one outbound headway after 8:00 PM that are slightly longer than 60-minutes.

### **Route 108: Linden Square – Wellington Station**

Route 108 provides service from Linden Square in Malden via Malden Station to Wellington Station. Although this route technically fails the Load standard for weekdays, no action is recommended, as the failure is due to a one-hour midday period that has two standees on average.

### **Route 109: Linden Square – Sullivan Station**

Route 109 operates from Linden Square in Malden via Glendale and Everett Squares to Sullivan Station in Charlestown. This route failed the Schedule Adherence standard on Weekdays, Saturday and Sunday. Weekday running times were adjusted for Summer 2003, and weekend adjustments will be made to correct this problem. This will be accomplished through minor changes that will not incur additional costs.

To alleviate loading problems on Saturday evenings, additional trips that short-turn at Glendale Square will be operated between 7:30 PM and 10:30 PM. This change is a part of the service improvement package that was developed as mitigation for the recent fare increase. It will, therefore, be funded outside of the existing operating budget.

### Route 111: Woodlawn or Broadway & Park Ave. – Haymarket Station

Route 111 provides weekday early morning, AM peak, PM peak and evening service from Park Ave. & Broadway in Revere via Bellingham Square in Chelsea to North Station and Haymarket Station in Boston. Two short trips operate in the early morning from Bellingham Square. All day on Saturdays and Sundays, and midday on weekdays, Route 111 operates from Woodlawn in Everett. A number of schedule adjustments have been made to alleviate load and schedule adherence problems on the Route 111. Most recently, for the Summer 2004, a short trip will be added in the morning, beginning service via Washington Ave. and arriving at Bellingham Square at 6:00 AM. Due to the length of the route, high ridership and traffic congestion, the Route 111 may continue to experience problems. The MBTA will monitor the route and will make further adjustments as needed.

### Route 112: Wellington Station – Wood Island Station

Route 112 operates between Wellington Station in Malden (on the Orange Line) and Wood Island Station in East Boston (on the Blue Line), providing service to Everett Square in Everett and Quigley Hospital, Admiral's Hill and Bellingham Square in Chelsea. Although this route technically fails the Span of Service guideline for weekdays, no action is being taken as the most recent data shows it failing by only 4-minutes on the first AM inbound trip. To alleviate Schedule Adherence problems on Saturday and Sunday, minor running

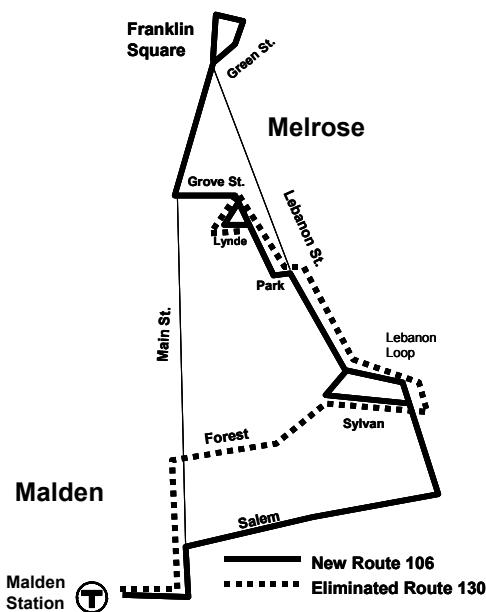
time changes were implemented in Winter 2004.

### Route 130: Linwood Ave.

#### Melrose – Malden Ctr. Station

Route 130 provides service from Lynde Street in Melrose via the Lebanon Loop to Malden Station. Beginning in Summer 2003, midday service on the Route 130 was eliminated on weekdays and was replaced by a rerouted 106, to serve the Linwood Avenue/Lynde Street area. It is being recommended that the remaining Route 130 weekday trips also be eliminated. Current Route 130 patrons in Melrose will be served by extending some peak hour Route 106 trips up Linwood Ave. to Lynde Street. In Malden, approximately 7 passengers formerly boarding/alighting on Forest Street will be inconvenienced by the loss of Route 130 service. However, elimination of Route 130 is necessary, due to its high Net Cost/Passenger.

Saturday service on the Route 130 will also be discontinued due to declining ridership and high Net Cost/Passenger.



The savings from this will allow for Saturday service on Route 132 to be improved from a 90-minute headway to a 60-minute headway. (See map for details).

### **Route 131: Melrose Highlands – Malden Ctr. Station**

Route 131 provides service from Melrose Highlands via east side Melrose to Oak Grove and Malden Stations. To alleviate weekday schedule adherence problems some minor running time adjustments were implemented in Winter 2004 without incurring additional cost.

### **Route 132: Redstone Shopping Ctr. – Malden Ctr. Station**

Route 132 connects the Redstone Shopping Center in Stoneham with Malden Station, via Wyoming Square in Melrose. Beginning in Summer 2003, the weekday headway was improved from 90-minutes to 60-minutes during the midday. This corrected the weekday midday Frequency of Service failure for this route, and should also solve Schedule Adherence problems. Saturday headways will also be improved from 90-minutes to 60-minutes (using resources gained by eliminating Route 130 Saturday service).

Although Route 132 fails the Net Cost/Passenger standard on Saturdays, it is recommended that the service be maintained, as it is the only route that serves this area, providing access to the Redstone Shopping Center for Saturday shoppers.

In response to customer requests, an additional weekday outbound PM trip was added at the end of the service day in Winter 2004.

### **Route 134: North Woburn – Wellington Station**

Route 134 operates between North Woburn and Wellington Station, via Veterans Memorial Senior Center, Woburn Square, Winchester Center Station, West Medford, Medford Square, and Meadow Glen Mall. In response to passenger requests and demonstrated demand, additional early morning service from Medford Square was started in Fall 2003 by adding a 5:50 AM inbound trip. Also in response to passenger needs, it is recommended that weekday hourly service to Anderson Regional Transportation Center, be implemented by extending the trips that currently end in West Medford to Anderson. On Sunday, existing hourly service (which currently terminates at Medford Square) will be extended to North Woburn. Saturday service will remain unchanged.

### **Route 135: Wakefield Square – Malden Station**

Route 135 currently exists in footnotes on the 136/137 schedule, operating some trips between Oak Grove Station and Wakefield Square and some trips between Malden Station and Wakefield Square via Oak Grove Station. It is recommended that the Route 135 trips be renumbered as variations of Route 136.

### **Route 136/137: Reading Depot – Malden Station**

Routes 136 & 137 operate together from Reading Depot to Malden Center Station, sharing the same alignment from Wakefield Square to Malden station via Franklin Square and Oak Grove Station. Between Reading Station and Wakefield, Route 137 operates south of

Lake Quannapowitt, primarily on Walter Brood Drive and North Ave., while Route 136 operates north of the lake on Salem St, Lowell St., etc. For the purposes of this Service Plan, Routes 135, 136 and 137 were analyzed together as one route, because they share much of the same alignment. Combined Routes 135, 136 & 137 pass all but the Schedule Adherence standard on weekdays and Saturdays. No action will be taken at this time pending collection of additional Ridecheck data.

### **Route 170: Bedford – Dudley via Back Bay**

Route 170 operates two outbound trips from Dudley Station in Roxbury to Oak Park in Bedford via Back Bay Station and Central Square, Waltham in the mornings. There is one return trip in the afternoon. This route does not meet the frequency of service and span of service standards. However, no change is recommended since this route is narrowly targeted toward reverse-commuters by design. Furthermore, bringing the frequency and span into compliance would exacerbate the already high net cost per passenger. The route also fails the net cost per passenger standard. No schedule changes are recommended; however, this route should be targeted to receive new route-specific signage at each stop to increase the visibility of this route and to attract new riders.

### **Route 171: Dudley Station – Logan Airport**

Route 171 provides early morning service from Dudley Station to Logan Airport via Andrew Station. The service is designed to carry airport employees to work before the regular subway and bus

network begins running. The route fails the span of service standard; however, since this route complements regular MBTA routes, no change is recommended. The route has a high net cost per passenger; however, further changes are not recommended, since the route was the result of a significant reduction in CT3 service to the airport in the 2002 Service Plan.

### **210: Fields Corner or North Quincy – Quincy Center**

Route 210 operates six days per week, via Hancock Street in Quincy. Saturday service operates Quincy Center – North Quincy, whereas weekday service is extended beyond North Quincy to Fields Corner in Dorchester. Route 210 experiences schedule adherence problems. Run time adjustments and on-time departures from North Quincy (regarding Fields Corner trips) should mitigate this. Saturday service fails cost effectiveness standards, and is provided at a 30-minute headway, which is not justified by the existing ridership (on average, about 3.5 boardings per trip, as decline of 25% between 1997 and 2002). It is proposed to halve the existing Saturday service (i.e., introduce a 60-minute headway), and redirect the resources saved to an all-new Sunday service in the North Quincy area, which has grown markedly since all Sunday bus service was discontinued there in 1981. See Route 211 for details.

### **211: Squantum – Quincy Center**

Route 211 operates six days per week, via North Quincy Station and Montclair. Route 211 experiences schedule adherence problems. On-time departures from North Quincy should mitigate this.

The MBTA has received requests for service along Quarry Street. Route 211 service along Newport Avenue (adjacent the Red Line, and less than a  $\frac{1}{4}$  mile walk from other MBTA bus service on Hancock Street) is lightly used (with an average of 37 customers boarding and disembarking on a typical weekday). Given the growth of new high-density residential developments with curbside frontage in the Quarry Street area, it is proposed to redirect alternating, coincident-flow (e.g. Quincy Center-bound AM, Squantum-bound PM) weekday peak-period Route 211 trips from Newport Avenue to Quarry Street. Thus certain Route 211 trips will operate Squantum-Quincy Center via North Quincy Station, Montclair, Larkin Square, and Quarry Street. It is proposed to designate these trips "Route 211Q" (Route 211 via Quarry Street).

Route 211 fails Saturday cost effectiveness standards. However, as it does represent the sole mobility option for the community of Squantum, no action is recommended.

An all-new Sunday combined Route 211/212 service is proposed. This will represent the first Sunday bus service in the area since 1981. The service is proposed to operate on a resource-driven headway (potentially every 85-90 minutes), from Quincy Center via Routes 212 and 211 to Squantum via North Quincy Station, where it will link with the Red Line and new Routes 203 and 204. The service is intended to:

- Link the geographically isolated area of Squantum with Quincy Center, and Dorchester/the South Shore

Plaza Mall retail complex (via connections).

- Provide new Sunday access to the Quincy waterfront, where water quality has improved markedly since 1981.
- Provide a new Sunday mobility option to Quincy neighborhoods that are beyond comfortable walking distance to Route 215 Sunday service, or the Red Line.

The designation of this proposed new Sunday-only service is "Route 211B" (Route 211 via Billings Road)

## **212: North Quincy – Quincy Center**

Route 212 operates six days per week, during three peak periods on weekdays (AM, School Release, and PM), and all day on Saturdays. Route 212 operates in close geographic proximity to Routes 210 and 217, and, with slightly over 200 typical weekday boardings, is the second most underutilized bus route in the Quincy service district.

Route 212 fails weekday frequency guidelines due to the lack of midday service and hourly headways in the PM Peak. However, given its proximity to other bus service, and very low ridership (six boardings per PM peak trip, on average), no action is recommended.

It is proposed to cancel the existing weekday 3:05PM northbound and 3:20PM southbound round trip (ten boardings total, on average) and shift the resources to an additional weekday evening trip departing North Quincy about 7:00PM. The existing, final weekday trip departs North Quincy at 6:20PM. It is anticipated that the addition of a later trip on weekdays will

increase the functional utility of Route 212, and will increase ridership. This new trip will also make after-work linked retail trips in the North Quincy area possible for Route 212 commuters.

On days when school is in session, the 7:20AM southbound trip operates in two sections, as Route 212-2 and trip S-95611B (average boardings are 13 and 11, respectively). It is proposed to cancel trip S-95611B.

Route 212 also fails the Saturday span guideline and the cost effectiveness standard. Service does not begin until 9:30AM, and ceases before 6:00PM. It is recommended that an early morning Saturday trip be added and that service end later. Thus Route 212 will present a realistic mobility option for commuters who work on Saturdays.

An all-new Sunday service on an 85-90 minute headway is proposed (see Route 211). This new service, combined with Saturday span improvements, will introduce daily service on Route 212 for the first time since 1981, and should grow ridership and mitigate cost effectiveness failure issues on Saturdays by introducing network synergies.

Route 212 experiences schedule adherence problems. Increasing emphasis on on-time departures from Billings Road should mitigate this.

#### **214: Germantown – Quincy Center**

#### **216: Houghs Neck – Quincy Center**

Service is provided to both Germantown and Hough's Neck daily. Monday-Saturday early and late hours, and all day on Sunday, Route 214 does not

operate, and eastbound Route 216-2 service to Hough's Neck operates via Germantown. Middays Monday-Saturday, Route 214 operates via McGrath Highway, to serve a large retail complex there. Routes 214 and 216 experience schedule adherence problems. Minor running time adjustments should address this.

It is proposed to redesignate Route 216 trips via Germantown "Route 216G" to make the service easier to understand.

#### **215: Ashmont – Quincy Center**

Route 215 operates daily. Service is relatively consistent Monday-Saturday. On Sundays, some variations extend service beyond Ashmont to Fields Corner, and provide some alternating-trip service via Adams Street and Whitwell Street ("Hospital Hill" in Quincy).

Route 215 experiences schedule adherence problems. Route 215 trips linked to Route 240 service at Ashmont were adjusted in the Spring of 2003. Schedule adherence problems resulting from tardiness on Route 240 also have been addressed.

It is proposed to renumber Sunday "Hospital Hill" trips to "Route 215H", to make the service easier to understand.

#### **217: Wollaston Station-Ashmont via Wollaston Beach**

Route 217 operates weekday/workdays only. Service is provided in the two commuter peaks, with one midday trip and one school-release period trip. Route 217, with about 200 typical weekday boardings, is the most underutilized Quincy service district bus route. With the sole exception of the mid-afternoon

trip, no trip experiences more than 18 boardings. Saturday service was eliminated on the Beale Street/Wollaston Beach segment of Route 217 in the summer of 2002 due to low ridership. The lack of midday service and 60-minute PM peak headways fails Route 217 apropos headway guidelines. Low ridership triggers a cost effectiveness failure. A restructuring of Route 217 is recommended.

The Adams Street, Milton segment of Route 217 is geographically isolated by linear distance from the Milton Trolley station, and undulating terrain. Hence, despite low ridership, discontinuance of Route 217 is not a realistic option. Recommended changes to Route 211 will leave Route 217 the sole bus service on portions of Beale Street in Wollaston. Hence, Route 217's retention is further justified. The demographic profiles of Route 217's service shed, and its proximity to other bus services, suggest that Route 217 cannot be justifiably retained in the form of a discrete mobility option. It should be restructured to act as a feeder and complement to other MBTA services.

The recommended changes are as follows:

- Route 217 should be extended beyond Wollaston Beach to Quincy Center station. This will make Quincy Center the nexus of the entire area bus network and encourage transferring to and from Route 217. It will also supplement existing Route 210 and 212 service, adding a walk-up headway element to Elm Avenue and Hancock Street bus service.

- Cancel trip S-95611A, and slightly alter one AM Quincy-bound Route 217 trip to cover its route. Trip S-95611A currently accommodates about 32 boardings on average, and existing Route 217 Wollaston-bound service has the capacity to accommodate them. This new Route 217 trip will be designated "Route 217M" via Montclair and North Quincy Station.
- Cancel trip S-95611C (35 boardings on average). The proposed extension of Route 217 to Quincy Center Station will make this trip unnecessary. The proposed 7:45AM departure from Ashmont will adequately serve trip S-95611C's customers.
- Cancel the midday trip to conserve resources. This round trip currently accommodates only about 12 customers, on average.
- Expand the span slightly in the PM to make Route 217 more attractive to commuters.
- Inaugurate a resource-driven schedule, similar to the sketch plan below:

Dep				Arr	Dep				Arr
Quincy Center	Woll. Beach	Woll. Beach	East Milton	Ashmt	Ashmt	East Milton	Woll. Beach	Woll. Beach	Quincy Center
620AM	630	638	644	656	700	711	728*	733	743
705	715	723	729	740	745	756	802	810	820
750	800	808	814	825	830	841	847	855	905
830	840	848	854	905	910	921	927	935	945
<b>205PM</b>	<b>215</b>	<b>223</b>	<b>228</b>	<b>240</b>	<b>245</b>	<b>256</b>	<b>302</b>	<b>310</b>	<b>320</b>
340	350	408	414	425	430	441	447	455	505
510	520	528	534	545	550	601	607	615	620
630	640	648	654	705	710	721	727	735	745

\* Time at North Quincy Sta, does NOT serve Wollaston Sta.

It is anticipated that this combination of initiatives will improve Route 217's performance. Focusing service along defined mobility corridors and adding

mobility options should enhance Route 217's functional utility, and raise its appeal to existing and prospective customers.

**220: Hingham – Quincy Center**  
 Route 220 operates daily. Service is provided from Quincy Center Station to Hingham Depot, with eastbound trips completing a one-way "balloon loop" through Old Hingham before laying over at the depot site on Station Street, Hingham. At certain times (weekday middays and evenings, Saturdays, and Sundays), the Old Hingham loop is omitted. Selected trips serve the Hingham Shipyard commuter boat dock directly.

Route 220 experiences schedule adherence problems. Increased emphasis on on-time departures from Bicknell Square, and run time adjustments, should mitigate this.

It is proposed to inaugurate a short-route "header" in the AM peak to address crowding in the Bicknell Square-Quincy Center route segment shared by routes 220 and 222. Three trips would be scheduled to depart from Bicknell Square at approximately 6:35, 7:00 and 7:25, with an estimated arrival time in Quincy Center 11 minutes later.

**221: Fort Point - Quincy Center**  
 The weekday-only Route 221 operates largely as a branch of Route 220, with very limited service from Bridge Street in Weymouth to Fort Point. The existing service includes three AM peak period trips, one school-release period trip, and one PM peak period trip. This triggers a frequency failure.

Of Route 221's 136 typical daily customers:

- Only 32 ride the route segment beyond Bridge Street.
- Forty utilize the Fort Point-bound school-release period trip half.

Thus the following is recommended:

- Cancel two of the three AM period trips. Thus the service will offer a balanced one AM trip and one companion PM trip. The departure from Fort Point should be about 7:30AM, roughly in-between the two more heavily utilized existing trips. This will inconvenience only about five customers, who will either shift their travel times earlier, or walk to Bridge Street for regular Route 220 service. The resources saved will be utilized to inaugurate three AM period Quincy-bound Route 220 short-route "headers" from Bicknell Square to Quincy Center (see Route 220).

## **222: East Weymouth - Quincy Center**

Route 222 operates daily. On weekdays, selected midday trips serve a variation via Essex Street in Weymouth.

Route 222 experiences schedule adherence problems. Increased emphasis on on-time departures from Bicknell Square, and run time adjustments, should mitigate this.

Trips operating via Essex Street are proposed to be re-designated "Route 222E," to make the service easier to understand.

## 225: Weymouth Landing - Quincy Center

Route 225 operates daily. Several early AM trips operate directly via Quincy Ave; Monday-Saturday, alternating trips serve Shaw Street or Desmoines Road; on Sundays, all service operates via Desmoines Road (i.e., via the 1000 Southern Artery senior citizen residence). With over 2,100 typical weekday boardings, Route 225 is the second most heavily utilized bus route in the Quincy district.

Route 225 experiences schedule adherence problems. Run time adjustments and improved mid-point adherence should mitigate this.

Route 225 experiences Quincy-bound crowding in the AM peak, in the vicinity of the Fore River Shipyard, largely due to ridership growth from new residential development there. As a result, it is recommended to inaugurate a short-route of two Quincy-bound AM peak period trips from the Shipyard around 7:15 and 7:35, arriving at Quincy Center around 7:25 and 7:45.

It is recommended to re-designate Route 225 as "Route 225D" (via Desmoines) and "Route 225S" (via Shaw) to make the service easier to understand. The Route 225 designation will remain for the Quincy Avenue direct trips.

## 230: Montello Station - Quincy Center

Route 230 operates daily. Several weekday and Saturday trips serve the Linwood Housing area in Holbrook. Although Route 230 serves about 1,100

boarding customers per typical weekday, Route 230 is long and this contributes to its failure of the cost effectiveness standards on weekdays and Sundays. Due to irregular headway gaps Route 230 fails weekday frequency guidelines as well. The following is recommended:

Inaugurate a resource-driven Sunday schedule, on an approximately 80-minute headway. Sunday service averages only about ten boardings per one-way trip. The existing first Quincy-bound Sunday trip (with an average of 20 boardings) is the most heavily utilized Route 230 trip of the day, suggesting that an earlier trip may be warranted. In addition, Sunday service could end one hour later. The existing final Montello-bound Sunday trip (with on average 19 boardings) is the *second* most heavily utilized Route 230 trip of the day, suggesting that a later trip may be warranted. Thus, the final southbound trip on a daily basis will depart Quincy Center consistently about 11:00PM. Although this proposal would result in a failure for the frequency standard the improved span could mitigate this problem.

Route 230 experiences schedule adherence problems. Run time adjustments, gleaned from forthcoming data regarding the winter, 2000 extension to Montello Station, should mitigate this.

## 236: South Shore Plaza - Quincy Center

Route 236 operates daily. The principal route segment serves Quincy and Braintree via local streets east of the Red Line. An extension (served by nearly every trip) operates beyond Braintree Station to the South Shore Plaza (SSP)

retail complex. Route 236 fails weekday and Saturday frequency guidelines, weekday cost effectiveness guidelines, and Saturday span guidelines, due to irregular headways and a late start on Saturdays.

It is proposed to cancel the weekday 3:20PM southbound and 4:00PM northbound trips (total boardings, 30) in deference to the 3:40/4:20PM trip (total boardings, 23) and thereby adjust an irregular headway transition. These resources will be shifted to a new late evening trip, departing SSP about 8:20PM.

On Saturdays, it is proposed to expand the span to encompass the full business hours of SSP, in order to provide better access to employment opportunities there (no similar adjustments are necessary on Sundays because SSP's hours are 11AM-7PM on Sundays, in lieu of 10AM-10PM on Saturdays and weekdays). This will require the addition of two trips, an AM trip departing Quincy Center at 8:40AM, and a PM trip departing South Shore Plaza at 10:20PM. Resources redirected by canceling the Route 238 short route on Saturday (Quincy Center – South Shore Plaza, See Route 238) will allow this span increase to be resource neutral.

### **238: Randolph - Quincy Center**

Route 238 operates daily. Most service is through-routed with Route 240, thereby providing one-seat service from Quincy Center to Ashmont via Randolph. On weekdays, the Randolph terminal is the Holbrook/Randolph commuter rail station. On Saturdays, the Randolph terminal is Crawford Square, and some mid-afternoon short route service from Quincy Center to South

Shore Plaza (SSP) is provided. On Sundays, the Randolph terminal is either Avon Line or Crawford Square. Route 238 service was adjusted in the Spring of 2003, to enhance schedule adherence. Due to irregular headways and a 70-minute Sunday cycle time, Route 238 fails frequency guidelines every day.

It is proposed to cancel the four existing Saturday afternoon Route 238-2 (Quincy Center – South Shore Plaza) round trips in deference to an expanded Route 236 service linking the same termini. See Route 236 for details.

On Sundays, the 7:30AM and 8:40AM southbound trips need not serve SSP directly, since the mall does not open until 11:00AM. Conversely, the northbound 7:50PM should serve the mall directly, to serve homeward-bound mall employees, since the mall closes at 7:00PM, and the prior trip serves the mall at 6:56PM.

On Sundays, the final southbound Route 238 (departing Quincy Center at 11:50PM) serves on average only 12 customers on its trip and subsequent trips on other routes. In contrast, the FIRST southbound Route 238 (departing Quincy Center at 7:30AM) serves on average 53 customers on its trip and subsequent two trips on other routes.

Thus it is recommended that the resources consumed by the final trip be redirected to an earlier trip, with a 6:20 a.m. departure time.

### **240: Randolph - Ashmont**

Route 240 serves about 2,200 boarding customers on a typical weekday, and as such is the most heavily utilized bus route in the Quincy service district.

Service operates daily, with most service through-routed with Route 238, thereby providing one-seat service from Quincy Center to Ashmont via Randolph. On weekdays, alternating trips serve the Randolph terminal at Avon Line or the Holbrook/Randolph commuter rail station. On Saturdays, alternating trips serve the Randolph terminal at Avon Line or Crawford Square. On Sundays, the Randolph terminal is either Avon Line or Crawford Square. Route 240 service was adjusted in the spring of 2003, to enhance schedule adherence. Due to irregular headways and a 70-minute Sunday cycle time, Route 240 fails frequency guidelines on weekdays and Sundays.

A suffix-based southbound destination designation is proposed. See Route 238.

It is recommended to annul the final Sunday round trip, and inaugurate a new early-morning Sunday trip. See Route 238.

**245: Mattapan – Quincy Center**  
 Route 245 operates six days per week. On weekdays, a variation serves Brook Road in Milton. On Sundays, a portion of Route 245 on Whitwell Street, Quincy, is served by a variation of Route 215. Due to irregular headway transitions, Route 245 fails weekday frequency guidelines. Modifications to Saturday service in 2002 (see Route 217) should have addressed Saturday cost guideline compliance failures (data are forthcoming).

It is proposed to cancel the existing weekday 10:00AM westbound and 10:30AM eastbound round trip. Instead, an additional weekday evening trip departing Quincy Center about 7:00PM

should be instituted. It is anticipated that the addition of a later trip on weekdays will increase the functional utility of Route 245. This new trip will also make after-work linked retail trips in the Quincy Center area possible for Route 245 commuters. Although this will introduce a frequency guideline violation, the improved span of service will better serve the patrons.

Route 245 experiences schedule adherence problems. Adjustments to the running times should mitigate this.

### **Route 275/276: Boston – Long Island Health Campus**

Schedule modifications to these routes are planned in accordance with the mobility needs of the institutions served by these routes. No structural or scheduling changes are recommended for these routes.

### **Route 325: Elm St. Medford – Haymarket via I-93**

Route 325 operates express between Elm St. in Malden and Haymarket Station in Boston via I-93. Although Route 325 fails the Schedule Adherence standard on weekdays, no action is recommended at this time, as the problems have been primarily due to the unpredictable traffic patterns caused by Big Dig construction. After completion of the Southbound Artery, additional data will be collected to determine whether running time adjustments should be made to ensure schedule adherence. To improve the weekday Net Cost/Passenger performance of this route, peak period headways will be extended to 20-minutes from 12- to 15-minutes.

### **Route 326: West Medford – Haymarket via I-93**

Route 326 provides express service via I-93 from West Medford to Haymarket Station in Boston. As with Route 325, Route 326 also fails the Schedule Adherence standard on weekdays, due to the unpredictable traffic patterns caused by Big Dig construction. After completion of the Southbound Artery, additional data will be collected to determine whether running time adjustments should be made to ensure schedule adherence.

### **Route 350: Burlington – Alewife**

This route connects Burlington, the Burlington Mall, and Woburn to Arlington Center and Alewife. Although it covers a significant distance, it is a local route. There have been some complaints regarding loads on Route 350, however observation has shown it to be within the crowding standard for a local route. A change is recommended to Route 351 that will alleviate crowding on Route 350 by diverting some of the customers with the longest rides to Route 351 (see below.) Route 350 failed the schedule adherence standard on weekdays, but as changes have been made since then, no action is recommended. Route 350 failed the schedule adherence standard on Saturdays, mostly due to early Outbound trips throughout the day. It is recommended that trips departing Alewife before 8:30 AM be given a running time of 35 minutes, and that the start of the 45 minute running time period be moved up from 5:30 to 1:30 PM. Route 350 failed the schedule adherence standard on Sundays, but it is recommended that no action be taken in this regard until additional data are available.

### **Route 351: Bedford – Alewife**

This express route connects Bedford and Burlington to Alewife Station. It fails the cost performance standard. Several suggestions on ways to alter Route 351 have been received. One of those would bring the route down Mall Road, where there is significant development. The bus would take exit 33 instead of exit 32; take Cambridge Street to Burlington Mall Road, and at the end of the road pick up the old route where it left off. This would add 82 passengers to Route 351 at a cost of \$121/day, after which it would pass the cost standard. This change is recommended.

### **Route 355: Mishawum Station – Boston**

Route 355 provides limited weekday service between Mishawum Station and Haymarket via I-93. This route operates only two outbound trips in the AM and two inbound trips in the PM, providing service in the reverse peak direction. In the peak direction, three of the four Route 355 trips operate as Route 352. Due to the limited service provided by the Route 355, it fails the Span, Frequency and Net Cost/Passenger standards. However, because three of the four Route 355 trips would be deadheads on Route 352 if the Route 355 were not operating, it is recommended that the one Route 355 trip that does not interline with Route 352 (inbound at 3:30 PM) be eliminated.

### **Route 411: Malden Ctr. Station – Revere/Jack Satter House**

Route 411 provides service between Malden Station and the Jack Satter House via Wonderland Station and Northgate Shopping Center in Revere and Granada Highlands and Linden

Square in Malden. Although the last ridecheck indicated that many weekday trips were arriving late throughout the day, a recent point check showed late trips only inbound at 3:40 and 4:30 PM. Therefore, by extending the running time for those two trips from 41-minutes to 46-minutes, the schedule adherence problems should be resolved. This will be done as a minor change without any additional cost. In addition, one AM inbound trip at the beginning of the service day on Saturday will be added to improve compliance with the Span of Service standard and to meet ridership demand.

### **Route 430: Saugus Center – Malden Center Station**

Route 430 operates between Saugus Center and Malden Center Station via the Saugus Iron Works and the Square One Mall. Weekday departure times were adjusted in Winter 2003, which should relieve crowding. In addition, on Saturday, additional trips have been added at the beginning of the service day to reduce loads and to improve compliance with the Span of Service standard.

### **Route 500: Riverside – Downtown Boston**

This express bus operates on weekdays during commuter hours between Riverside Station and Downtown Boston. The route has a high cost per passenger, therefore it is recommended that AM peak service be modified to operate every 20 minutes rather than every 13-15 minutes. This change in frequency is expected to cause 40 passengers to seek alternate transportation services, such as the Worcester Branch Commuter Rail or the Riverside Green Line. The ridership

loss is expected to be offset by 20 passengers attracted to earlier departures at 6:15 AM and 6:35 AM. The earlier AM service would bring the route into compliance with the Service Delivery Policy's span of service guideline.

In the afternoons, the 2:30 PM and 3:30 PM departures outbound and the 3:05 PM departure inbound would be discontinued due to extremely light ridership. These three trips carried 11 passengers total, or an average of 3.7 passengers per trip. The PM peak frequency would also be modified to every 15-25 minutes rather than 15-20 minutes. This frequency change is expected to cause 22 passengers to take the Green Line or the Commuter Rail.

The service restructuring would allow in part for the new Route 503 express service to begin operating. This change is expected to allow two AM peak vehicles, one PM peak vehicle, and 5 hours of service to be reinvested into the new Route 503, and is expected to improve the net cost per passenger from \$3.59 to \$3.05.

### **Route 501: Brighton Center – Downtown Boston via Oak Square**

Route 501 provides express weekday service between Brighton Center and Downtown Boston via Oak Square. Due to poor schedule reliability during the evening peak, it is recommended that the schedule frequency be modified very slightly. Trips that run every 5 minutes would instead run every 5 or 6 minutes. Trips that run every 6 or 7 minutes would run every 7 or 8 minutes. It is expected that 9 passengers would seek alternate transportation due to the frequency change, although some may

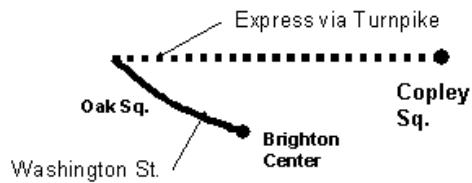
be retained due to the reliability improvement. Due to crowding on the 7:05 PM trip (67 passengers), it is recommended that a new outbound trip at 6:50 PM be operated. This would improve the interval between trips from 30 minutes to 15. This change would attract 25 new passengers to the route due to the frequency improvement, and would reduce the number of passengers per bus from 67 to 46. This would add 1 hour of service into the timetable.

### **Route 502: Watertown Square – Copley Square**

Route 502 is an express route that provides weekday peak period service between Watertown Square and Copley Square. Schedule modifications in Fall 2003 are expected to have addressed crowding and route reliability problems in the AM Peak.

### **Route 503: Brighton Center – Copley Square NEW ROUTE**

Due to requests for direct service between Brighton Center and Copley Square, it is recommended that a new express route begin operating during rush hours. The new route would travel from Brighton Center to Oak Square via Washington St. The route would continue on Park St. to the Turnpike, where it would travel express to Copley Square. On a trial basis, this route is recommended to operate every 25 minutes from 7:00 AM – 9:00 AM and from 4:00 PM – 6:00 PM. This route would have a total of 7.3 service hours. It is expected that this route will attract 330 new passengers.



### **504: Watertown Square – Downtown Boston**

Route 504 is an express route that provides weekday and Saturday service between Watertown Square and downtown Boston. Several schedule changes have already been implemented and are expected to have addressed reliability concerns.

### **Route 505: Central Square, Waltham – Downtown Boston**

Route 505 provides weekday express service between Central Square, Waltham and downtown Boston via West Newton and the Turnpike. Due to poor on-time performance, several minor schedule changes are recommended. These will not improve the schedule frequency, but will add an hour of service to the timetable.

### **Route 553: Brandeis/Roberts – Downtown Boston via Newton**

Route 553 provides local service between Brandeis/Roberts, Central Sq., Waltham, and Newton Corner via West Newton with express service to Boston via the Turnpike on weekdays. On Saturdays, the route fails the net cost per passenger standard. However, no change is recommended since any reduction in service would cause the route to fail the MBTA's frequency guidelines. Several minor schedule adjustments would also be implemented to improve the route's on-time performance.

### **Route 554: Waverley Square – Downtown Boston**

Route 554 provides weekday and Saturday service between Waverley Sq. and Newton Corner via West Newton and Central Sq., Waltham. On weekdays, the route continues express to downtown Boston via the Turnpike. On Saturdays, the route fails the net cost per passenger standard. However, no change is recommended since any reduction in service would cause the route to fail the MBTA's frequency guidelines. Several minor schedule adjustments would also be implemented to improve the route's on-time performance.

### **Route 556: Waltham Highlands – Downtown Boston via Newton**

Route 556 provides weekday service between Waltham Highlands and Newton Corner via Central Square, Waltham. During rush hours, the route continues express between Newton Corner and Downtown Boston via the Turnpike. This route does not meet the frequency standard in the afternoon rush hour; however, no change is recommended since there are few passengers during this time period, and this would exacerbate the already high net cost per passenger. Several minor schedule adjustments are recommended to improve the on-time performance.

### **Route 558: Auburndale – Downtown Boston via Waltham**

Route 558 provides weekday service between Auburndale and Newton Corner via Central Square, Waltham. During rush hours, the route continues express between Newton Corner and Downtown Boston via the Turnpike. This route does not meet the crowding standard due

to a load of 67 passengers during the peak half-hour. However, more than half of these passengers boarded at the Newton Corner stop, which is also served by Routes 504, 553, 554, and 556. It is expected that these routes offer sufficient capacity to Boston from Newton Corner.

Since the Waltham CityBus ceased offering service between Waltham and Riverside Station on the D Branch of the Green Line, it is recommended that the 558 be extended from its Auburndale terminus to Riverside. This route extension would add an extra 1.4 miles and 5 minutes to each half-trip. This would force some trips to be shifted as shown below. The new service is expected to attract 24 new passengers, although the frequency change is expected to cause 13 passengers to use alternate services. This proposal is expected to attract a total of 11 new riders and add nearly an hour of service to the timetable. Furthermore, several minor schedule adjustments are recommended to improve on-time performance.

#### Inbound:

6:30 AM → 6:25 AM  
 7:30 AM → 7:35 AM  
 8:00 AM → 8:00 AM  
 9:05 AM → 9:05 AM  
 1:45 PM → 1:15 PM  
 2:45 PM → 2:25 PM  
 3:45 PM → 3:35 PM  
 4:45 PM → 4:45 PM (no change)  
 5:45 PM → 5:45 PM (no change)  
 6:15 PM → 6:20 PM  
 6:50 PM → 6:50 PM (no change)

#### Outbound

7:00 AM → 7:00 AM  
 7:10 AM → 7:05 AM  
 8:15 AM → 8:15 AM (no change)

12:55 PM → 12:15 PM  
 2:15 PM → 1:50 PM  
 3:15 PM → 3:00 PM  
 4:15 PM → 4:10 PM  
 4:45 PM → 4:45 PM  
 5:14 PM → 5:14 PM (no change)  
 6:00 PM → 6:00 PM (no change)

### **III. ROUTES REQUIRING ADDITIONAL DATA COLLECTION**

The data collection effort for analyzing the routes is an ongoing process. Although many small changes are made each quarter, some routes were identified as failing because the data were collected before the change took effect. Another concern is that the data may now be out of date and there is reluctance to make recommendations based on older data. Due to these data collection problems it is recommended that the schedules of the following routes, not be modified due to schedule adherence issues, on the days specified, until an update of the data is available.

<b>Route</b>	<b>Day of the Week</b>
#	
64	Saturday, Sunday
69	Saturday
71	Saturday
72	Saturday
72/75	Saturday, Sunday
73	Weekday, Saturday
75	Weekday, Saturday
77	Weekday, Saturday, Sunday
78	Weekday, Saturday, Sunday
79	Weekday
89	Saturday
90	Weekday & Saturday
91	Saturday & Sunday
92	Saturday
93	Weekday, Saturday & Sunday
94	Saturday & Sunday
95	Weekday, Saturday & Sunday

96 Saturday & Sunday  
 97 Saturday  
 99 Weekday, Saturday & Sunday  
 100 Saturday & Sunday  
 101 Saturday & Sunday  
 105 Saturday & Sunday  
 106 Saturday & Sunday  
 108 Weekday, Saturday & Sunday  
 110 Weekday, Saturday & Sunday  
 112 Weekday  
  
 134 Weekday, Saturday & Sunday  
 136/137 Weekday, Saturday  
 352 Weekday  
 411 Saturday  
 430 Weekday, Saturday & Sunday

### **IV. SERVICE CHANGE PROPOSALS THAT ARE NOT RECOMMENDED**

#### **Route 5: McCormack Housing Development – City Point via Andrew**

In addition to the schedule change that was recommended, there has been a proposal to extend Route 5 to JFK/UMass Station from McCormack Housing. This route change would allow South Boston residents, including McCormack residents, to take advantage of the multimodal transfers available at JFK/UMass Station. However, this would force McCormack residents with destinations on East Broadway either to board a bus headed the "wrong way" toward JFK/UMass Station or to cross Old Colony Ave. and Columbia Rd. to access the bus stop. This change is not recommended, since there is no pedestrian facility across Old Colony Ave. and Columbia Rd. at McDonough

Way, which is the primary McCormack stop.

### Route 8 or 16: Direct Connection between Strand Theatre and UMass

There was a community request for a direct connection between UMass Boston, the Kennedy Library, and the Strand Theatre. This connection is presently only available during a limited number of hours during weekday peak travel periods on Route 16. Midday and evenings on weekdays and all day on weekends, passengers would board either the MBTA Route 16 or 17 and transfer to the MBTA Route 8, or board the MBTA Route 41 and transfer to the free UMass or Museum shuttle buses.

Below are two proposals for creating a direct link between the JFK Library and the Strand Theatre:

- Extending non-peak period Route 8 to Uphams Corner
- Extending non-peak period Route 16 service to UMass Boston and the JFK Library.

If the Route 8 were extended to Uphams Corner, this would add a mile-long loop to each direction of the route, or approximately 6-8 minutes of travel time each way. Based on the frequency change that would be required to implement this route extension, approximately 82 weekday passengers, 67 Saturday passengers, and 46 Sunday passengers would stop riding Route 8. Based on existing transfer information this loss would be offset by approximately 20 daily riders who would use the Uphams Corner connection.

AM Peak: now: every 12

		(no change; use Route 16)
AM Base:	now:	every 45
	would be:	every 50
PM Base:	now:	every 22
	would be:	every 25
PM Peak:	now:	every 20
		(no change; use Route 16)
Late:	now:	every 45
	would be:	every 55
Sat Peak:	now:	every 35
	would be:	every 40
Sun Peak:	now:	every 35
	would be:	every 40

If the Route 16 were modified to serve UMass Boston weekdays in the midday and evenings and on weekends, this would add 4.9 miles per round trip. Assuming that the vehicle requirement remains unchanged, this would result in the frequencies being changed from a bus every 30 minutes to a bus every 40 minutes in the midday and weekends. In the evenings, this would modify the frequency from a bus every 40 minutes to a bus every 60 minutes instead. It is expected that 221 fewer weekday passengers would ride Route 16 due to the frequency change, but 144 new Route 16 passengers on the extended segment would offset this loss. On Saturday, it is expected that 258 fewer passengers would ride due to the frequency change, but that 161 would be attracted to the extension. On Sunday, 165 fewer passengers would ride due to the frequency change, but 102 new passengers would be attracted.

AM Peak:	every 16 minutes
	(already goes to Umass)
AM Base:	now: every 60
	would be: every 80
PM Base:	now: every 30
	would be: every 40

PM Peak:	now:	every 15
	(already goes to Umass)	
Late:	now:	every 40
	would be:	every 60
Sat Peak:	now:	every 30
	would be :	every 40
Sun Peak:	now:	every 30
	would be:	every 40

Given the projected net loss in passengers and the existing availability of two-seat ride service, the proposed modifications to Route 8 or 16 are not recommended.

### **Combining Route 24 and Route 27**

A proposal was studied to combine Route 24 with Route 27 at all times as new Route 24 (Wakefield and Truman – Ashmont Station). The proposed restructuring would result in the following weekday changes:

Route 24 → New Route 24/27

- AM Peak is every 20 mins. → would be every 25 mins.
- Late AM is every 50 mins. → would be every 40 mins.

Route 27 → New Route 24/27

- AM Peak is every 35 mins. → would be every 25 mins.
- Late AM is every 30 mins. → would be every 40 mins.

Route 27 currently fails the AM peak frequency guideline due to a 35-minute headway. This restructuring would result in a 25 minute headway during the AM peak. This restructuring would address complaints regarding missed route 24/27 connections at Mattapan. In addition it will offer a consistent, easy-to-understand one-seat service from Wakefield Ave to Ashmont and will

provide better weekday AM peak and morning service on segments of existing Routes 27 and 24.

This change was rejected for the following reasons. Route 24 carries more people than route 27 in the AM peak (approx. 250 and 91 passengers respectively), so this change would result in an overall increase in waiting time and decrease in ridership. Keeping the routes separate is good for each route's reliability. Finally, the Mattapan Trolley offers very frequent service in the AM peak, so the benefit of a one-seat ride to Ashmont is likely to be minor. However, some of these ideas were incorporated into proposed changes.

### **Combining Route 30 and Route 31 on Sundays**

A proposal was studied to combine Routes 30 and 31 on Sundays. When either route arrived at Mattapan it would leave as the other route. Route 30 would also be extended to Forest Hills. This would result in the following Sunday changes:

- Route 30 is every 60 mins. → would be every 30 mins.
- Route 31 is every 20 mins. → would be every 30 mins.

One benefit to this change would be the simplifying of route 30, which (when these changes are combined with others that were accepted) would run between Forest Hills and Mattapan whenever it was in service. Another benefit would be that service on either route in either direction would take the rider to Forest Hills, sometimes directly and sometimes by way of Mattapan. While service in one direction along Blue Hill Ave would

be every 30 minutes, passengers going to Forest Hills could board a bus in either direction, resulting in two buses every 30 minutes. (As these buses would be moving in opposite directions, this would be a 15 minute headway in some places, alternating 10 and 20 minute headways in other places, alternating 5 and 25 minute headways in other places, etc.)

This proposal was rejected because it was felt that it would result in a net increase in passenger waiting time because route 31 carries 8 times as many passengers as route 30, and because it would be too confusing a concept to explain to riders. The idea that buses in either direction take you to the same place, but only on Sundays, is a difficult one to communicate. Other considerations were that route 31 has over 1,800 Sunday riders compared to route 30's 222 riders; there is a potential for crowding problems on route 30 if the headway is changed; Blue Hill Avenue is not always easy to cross, making it difficult for passengers to reach the first bus they see if it is across the street; and route 30 and 31 leave from different parts of Forest Hills station making the benefit even more difficult for passengers departing from there to take advantage of.

### **Combine routes 37 and 38**

A suggestion was received to combine routes 37 and 38. A combined "Route 37/38" already replaces the two routes on weekends, and this proposal would run the same route on weekdays under a new name, replacing the existing routes 37 and 38, with the same frequency and span of service of the existing route 38. This proposal would strand 133 riders, who use the portion of the 38 that runs on Anawan, Part Street and Woodward.

The elimination of service in that area also violates the Service Coverage Policy Objective. For this reason, this version of the proposal was rejected. Two additional variations were then considered. One would follow the 37/38 except that on both its inbound and outbound trip it would turn onto West Roxbury Partway southbound, turn right on Woodward, right on Park, right on Anawan, left on West Roxbury Parkway and turn onto Centre Street for the regular route. This would add the Wren Street area to the 37/38 route and would require permission to operate farther on a Department of Conservation and Recreation roadway. The other variation would not serve Centre Street between LaGrange and West Roxbury Parkway, but would take service deeper into the neighborhood south of Centre St. A trip to Forest Hills would stay on Lagrange past Centre, turn left on Tennyson, straight to Woodward, left on Park, right on Anawan, left on West Roxbury Parkway, and right on Centre Street to the regular route. A trip from Forest Hills would follow the same route. Either of these changes would lose 100-300 riders due to the reduced frequency of service on portions of Centre, Belgrade and Washington. An additional 581 riders would shift to other routes which could create crowding problems.

Given that it is proposed that routes 35 and 36 be combined, and these routes also serve Belgrade Avenue, combining route 37 and 37 at the same time would be too dramatic a reduction on Belgrade Ave. However the concept should be remembered for future consideration in later service plans.

## Combine Route 48 with Route 38

This proposal is in response to a customer request to consider the impact of merging Routes 38 and 48. Under this proposal, Route 38 between 9:00 AM and 4:00 PM Monday-Friday would be rerouted to Jackson Sq. Station instead of Forest Hills. From Center & South St., inbound buses would continue along Center St., Paul Gore St. and Chestnut St. to Jackson Sq. station. Outbound buses from Jackson Sq. would operate via Columbus Ave., Amory St., W. Walnut Park, Washington Sr., Green St., Amory St., Boylston St., Lamartine St., Green St., and Center St. and then regular route to Wren St.

This merger would result in a major degradation of service for Route 38 passengers. The travel time to and from the Orange Line would increase by 10 minutes inbound and 13 minutes outbound. Direct connections with other bus routes at Forest Hills station would be lost, with an additional transfer to Route 39 or the Orange Line required. The most recent passenger survey data for Route 38 shows no transfers taking place between Routes 38 and 48, however 34% of Route 38 riders were transferring from other bus routes at Forest Hills.

The impact on Route 48 riders would not be as great, although passengers traveling from Center St. to Amory St. and Lamartine St. would need to wait on buses during the layover at Jackson Sq. station to complete their journey. Passengers traveling from Amory St. and Lamartine St. to locations on Center St. north of Green St. would be required to board an outbound Route 38/48 bus and

transfer at Center St. to an inbound Route 38/48 bus, Route 39, or Route 41.

As an alternative, consideration was also given to discontinuing Route 48 and rerouting Route 38 to Green St. station, following a pattern once operated on Route 38 prior to 1981. This proposal would result in no bus service on Paul Gore St., Amory St., or Lamartine St. There would be little benefit to any existing Route 48 passengers. The impact on Route 38 passengers would be similar to the earlier proposal in that travel times from the Orange Line would be increased. Bus connections at Forest Hills would be maintained if Forest Hills was served by the loop, however outbound travel time from Forest Hills would increase because of the need to serve Green St. Service in 1981 was rerouted to Forest Hills in place of Green St. partially in response to passenger complaints concerning delays from traffic on Center St. between Green St. and South St., and a desire for better connections at Forest Hills station.

Based on the potential negative impacts on existing riders, neither of these changes are recommended.

## Route 39: Short Turn service

A proposal was considered to reallocate two of 20 existing weekday PM peak buses in short-turn service, operating only between Copley/St James and the JP Monument, to gain extra trips at no cost. This would add service to the most heavily used portion of the route. However these trips would not go all the way to either end of the route, which is likely to cause customer confusion. The trips would also not go to Back Bay station, which unlike Copley is fully accessible to persons with disabilities.

For these reasons the proposal is rejected.

Additionally, a set of suggestions for alternate downtown routing was rejected because it involved operating on streets where the MBTA cannot operate.

### **Route 51: Service to Lagrange Street in Chestnut Hill**

A proposal to alter routes 38 and 51 to service Lagrange Street in Chestnut Hill because it would be too disruptive to existing riders while producing insufficient benefits for the cost. An alternate proposal, to serve Lagrange through more modest modifications to routes 51 or 37, is still under investigation.

### **Route 64: Service in Brighton**

There was a request from the Boston Transportation Department to reroute a portion of the Route 64 through Brighton. The existing route travels along North Beacon St., Brooks St., Hobart St., Falkland St., and Faneuil St. The route was suggested to travel along Market St. and Faneuil St. instead. This change would have operational benefits from avoiding small, residential streets. However, this would bypass a significant portion of the distribution area and would compel nearly a third of the route's riders to walk an additional 5-10 minutes. Therefore, this change is not recommended.

Another suggestion was to remove route 64 from Hobart and Falkland streets, particularly Hobart which is narrow and has a small playground. An alternate route was not specified, but it would presumably eliminate service on the portion of Faneuil Street between Falkland and Arlington as well, perhaps

by proceeding straight on Brooks to Faneuil. Each weekday this route serves 112 customers on Hobart, Falkland and the affected portion of Faneuil (not counting the 76 customers served at the corner of Brooks and Hobart and the corner of Faneuil and Fairbanks.) While members of the community have raised this issue before, there has never been consensus as to what alternate route would be preferable, and there is no clear alternative that would not continue to serve those 112 customers. Therefore no change is recommended.

### **Route 68: Extension to Lechmere**

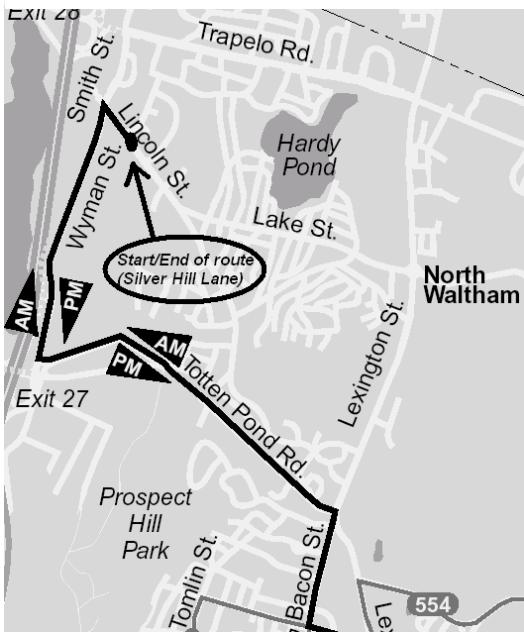
A suggestion was received to extend Route 68 from Kendall to Lechemere station. It was estimated that this would add 59 riders per day, and would increase the daily operating cost by almost \$800. If put into effect this route would no longer pass the cost standard, therefore this change is not recommended.

### **Route 70A: New North Waltham routing**

A suggestion was received to simplify the 70A routing in North Waltham. To evaluate this suggestion one must first understand the current route, which is one of the most complicated routes the MBTA runs. In North Waltham, route 70A serves the largely residential area of Lexington, Trapelo, Lincoln and Lake, and it serves the more industrial Wyman and Totten Pond Road. For the residential areas, it provides service to Cambridge in the AM and from Cambridge in the PM. For the industrial areas it provides service from Cambridge in the AM and to Cambridge in the PM. The resulting service pattern is shown below.

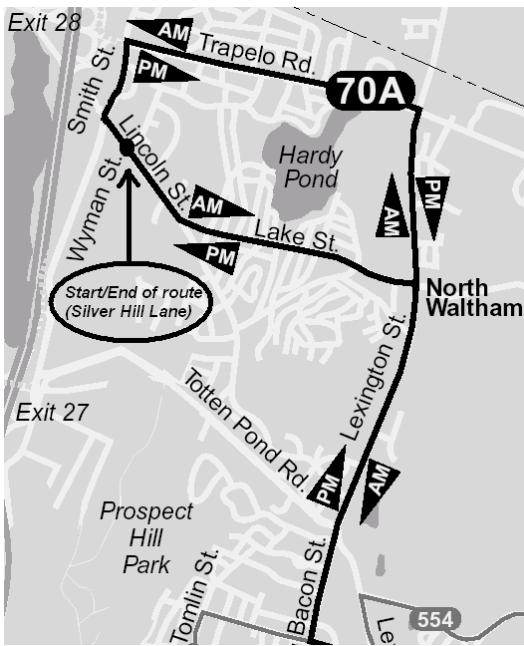
## Commuting to Waltham

(From Cambridge in AM, to Cambridge in PM)



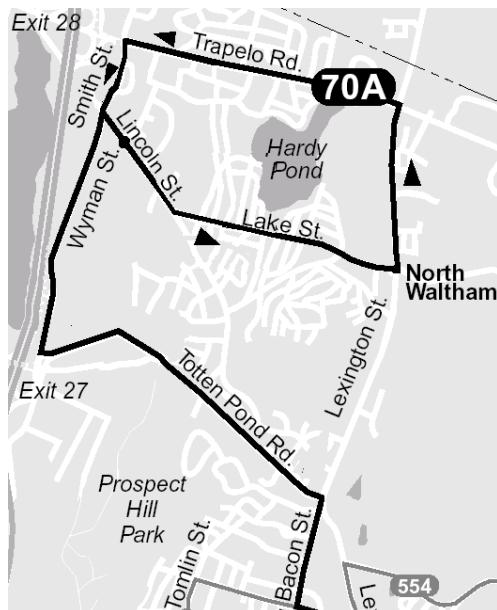
## Commuting from Waltham

(To Cambridge in AM, from Cambridge in PM)



This pattern is so complicated it is confusing to regular riders and even bus drivers, but it does have the advantage of meeting the commuting needs of the area well. The following suggestion was received to simplify the route:

## Proposed routing



In this scenario, service on Totten Pond Road and Wyman Street would be regular two-way service. Lincoln, Lake, the portion of Lexington between Lake and Trapelo, Trapelo, and Smith would have service to Cambridge in the morning and from Cambridge in the evening, but always on the same side of the street. Between Totten Pond and Lake Street, there would be no service. This portion of Lexington Street has less than 5 daily boardings, but does contain a high school.

Unfortunately, in order to give the residential streets inbound AM / outbound PM service without making passengers wait through a layover, one of three conditions would need to be met. One, the route could be operated without a layover, which is highly inadvisable for a route that is close to an hour long. Two, the route could have a layover before the loop in the AM and after the loop in the PM, but that would require a layover on Smith Street just after Lincoln, where the bus would block the only lane of traffic on a busy street.

Three, the loop could run counter-clockwise in the AM (as shown) and clockwise in the PM with the layover at Silver Hill Lane the entire time, which would work but makes the route almost as confusing as it was before.

### **Route 70A: Extend to 1100 Winter Street**

Another suggestion was received about the 70A, this one to extend it to 1100 Winter Street. This is an office park on the west side of the Cambridge Reservoir. Adding this would add about 3 miles to a round trip, through very low-density streets with the reservoir on one side. The office park itself is spread out, making it difficult for a bus to be competitive. (A number of office parks do not have bus service for this reason.) Adding this service would make it more difficult to coordinate the schedules of the 70 and 70A, delay service for 22 Wyman Street riders by approx. 6 minutes, and attract very few riders from the office park. It is not recommended.

### **Route 74: Later Saturday, Sunday service**

A suggestion was received to extend route 74 service later into the evening or add it Sunday. All of route 74 is either served by route 72/75 or route 78 Saturday evening and Sunday the evening, or is within a quarter-mile walk of one of them. On Saturday evening and Sunday route 72/75 has a headway of 40 minutes and route 78 has a headway of 60 minutes. This system was created in 1998 because of low ridership on route 74 during those times. When newer data is collected these routes will be re-evaluated.

### **Route 77: Reduced Early AM Service**

A suggestion was received to reduce service on route 77 before 6AM. The first 6 Inbound trips on route 77, which occur between 4:48 and 5:59 AM at a 12 minute headway, have an average of 14 boardings each, suggesting that less resources could be

applied. Service could be reduced from 4 buses running every 12 minutes to 3 buses running every 16 minutes. This would cost the MBTA about 9 riders and save it \$79. As the route is now, it offers service at every 13 minutes or better from its first trip until its last, and changing that may have a broader ridership impact. It was concluded that this should not be pursued just as the key route program goes into effect, however if there is an opportunity to derive broader savings by cutting this one hour of service, this may be re-examined.

### **Route 77/77A: Coordinate PM departures**

A suggestion was received to coordinate the early evening departures of the 77 and 77A from Harvard. The purpose would be to have a 77A leave just a minute before the 77, handling local traffic and allowing the 77 to travel faster. (The 77A trips in this period are necessary to return the Trackless Trolleys that had been doing work on the 71 and the 73 back to the garage in North Cambridge.) Unfortunately, while this could be scheduled to happen on paper, it is very difficult to do in practice. There is some normal variation in the time it takes the 71 and 73 to complete their Inbound trips and arrive at Harvard, so the actual arrival at Harvard Square varies by a few minutes each day. As soon as a vehicle on route 71 or 73 reaches Harvard, it must enter the station to let passengers off. As soon as the passengers are off, it must let new passengers board and it must leave the station to avoid blocking other routes that use the single-lane tunnel. So the only ways this could be done to help the 77 would have negative consequences to other routes that far outweigh the benefits to route 77. Therefore changing the schedule in this way is not recommended.

### **Route 79: Increase or eliminate service**

A suggestion was received to either increase service on route 79 in the mid-day to 15 minutes or less, or to eliminate it. The underlying logic is that the 77 overlays with most of the 79 except for Alewife, and route 79 would need to run more often to be a worthwhile alternative to the 77. Another suggestion was to reduce the amount of service in the PM peak, on the grounds that it is underused. The most recent ridership data on route 79 is several years old, making an accurate analysis of these proposals difficult. Therefore no such change is recommended at this time. When new data on route 79 is collected, its performance and its relationship to route 77 can be studied in full.

### **Route 80: More frequent midday service**

A suggestion was received to increase the number of trips on route 80 in the midday. Current midday service meets the passenger load standard. Currently, between 10AM and 2PM there are 2 buses on the line making round trips that take 70 minutes, for service every 35 minutes. If another bus were added, service would run every 25 minutes. This would attract approximately 38 riders at a net cost increase of \$330, or almost ten dollars for every new rider. This change is not recommended.

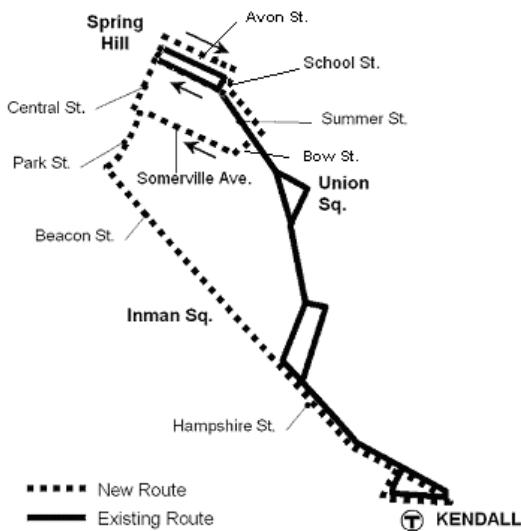
### **Route 85: Eliminate midday service**

A suggestion was received to eliminate mid-day service on route 85. This would violate the “span of service” standard for local routes. Moreover, route 85 does enhance mid-day mobility for Spring Hill residents. It is possible to reduce service in the midday at significant savings without eliminating it. Elimination of midday service is not

recommended.

### **Route 85: New route via Inman**

Since the extension of CT2 to Sullivan, much of Route 85 has become redundant. Route CT2 serves Union Square and Kendall more often, for a longer time of day, and with faster, limited-stop service, although it is a longer route and therefore less reliable. The MBTA considered a suggestion to reroute the 85 through Inman Square to reduce the overlap with CT2 and improve reliability. Many of Route 85's riders travel between Spring Hill and Kendall, and the CT2 does not go to Spring Hill, so the route would still serve an important purpose. This would provide greater connectivity throughout the area by adding a connection along Beacon Street (including Inman Square and including a supermarket) to Spring Hill and to Kendall. It would improve reliability for travel between Spring Hill and Kendall by taking the route out of Union Square. It would remove the connection between Spring Hill and Union Square, which is within walking distance, and Cambridge & Columbia Streets, which is not. The new route would be: out from Kendall on Broadway and Hampshire as it does now, straight on Hampshire, right on Park Street, Left on Somerville, right on Central, right on Avon, right on School, left on Summer, right on Bow, right on Somerville, left on Park Street, left on Beacon and back to the existing route.



Although this route would be more reliable, testing showed that it would also take up to 15 minutes longer for a round trip than on the existing route. This would cancel out any reliability benefits that could be gained and force a less frequent schedule.

An alternative routing was also considered. It would differ by running right on Central, right on Highland, right on School, and right on Somerville. While this route would be 3-4 minutes shorter and cover a slightly larger area, any cars parked close to the corner at either Highland & School or School & Somerville would block the route, making it impractical for regular service. Because the gains from this change are outweighed by the running time and resulting frequency change, this change is not recommended.

### **Extend Route 86 to Powder House Square via Broadway Combine Route 86 and Route 89**

A suggestion was received to extend Route 86 to Powder House Square from Sullivan along Broadway. As this would duplicate almost the entire route

89, and these routes have comparable headways through most of the day, this suggestion was evaluated as a proposal to combine the two routes. In theory, this would attract some riders who would benefit from a one-seat ride between Winter Hill and Harvard Square, a major destination and a Red Line connection. In practice, however, such a route would be impossible to operate with an acceptable level of reliability. Route 86 has significant reliability problems due to its length and the number of congested areas through which it passes. This problem is made more significant by the fact that Harvard Square, the busiest stop, is in the middle of the route. To extend the route an additional 6.5 miles would exacerbate a problem the T is trying to alleviate, worsening reliability along the entire route and particularly at Sullivan Square, its second-busiest stop. At 24-34 minutes, the Red Line connection would be a significantly longer passenger trip than the 7-9 minutes in the Davis modification that is proposed, and even the travel time to Harvard Square would be longer, although it would not require a transfer. Due to the operational difficulties, this change is not recommended.

### **Route 89: Clarendon Hill – Sullivan Station**

A request was made for additional Sunday and evening service on the Route 89. The most recent Ridecheck data for this route does not, however, show a demand for more service.

### **Route 90: Davis Square Station – Wellington Station**

Route 90 provides service between Davis Square and Wellington Station via Union Square and Sullivan Square. To

alleviate weekday Frequency of Service problems, a proposal was evaluated to improve headways from 70 minutes to 35 minutes between 8:30 AM and 12:30 PM. This proposal was not recommended, because an additional vehicle would be required to improve the headways and the current midday vehicle loads do not demonstrate a need for additional service.

Sunday service on Route 90 was requested and considered. However, the most recent data collected on Route 90 indicate that, based on Saturday ridership, demand for Sunday service would be very low. New data on Route 90 will be collected soon, and the Sunday service will be re-considered if Saturday demand has increased significantly.

### **Route 91: Sullivan Sq. Station – Central Square Cambridge**

Route 91 connects Sullivan Square with Central Square (Cambridge) via Union Square and Inman Square. In response to customer requests for more service to the Charlestown Navy Yard, a proposal was evaluated to extend Route 91 to the Navy Yard via Medford Street from 6:30 AM to 6:30 PM on weekdays. Although this extension passed the Net Cost/Passenger standard, it is not being recommended, because the total cost of implementation was very high.

### **Route 94: Medford Square – Davis Square Station**

Route 94 provides service from Medford Square via West Medford to Davis Square in Cambridge. A request was made for additional early morning service. Data collected recently, however, does not indicate demand for more service in the early AM.

### **Route 94: Medford Square – Davis Square Station**

### **Route 96: Medford Square – Harvard Station via George St.**

These two routes share the same alignment along Boston St. in Medford and College Ave. in Somerville to Davis Sq. It was requested that the headways should be better coordinated between these two routes to provide a more even frequency of service for riders making trips along their common alignment. Unfortunately, this is not possible as the two routes have different cycle times and different headways, which are based on ridership demand. In addition, to conserve resources, many trips on these two routes are interlined (i.e., they share the same equipment, so the same vehicle operates as a Route 96 on one trip and as a Route 94 on another trip). Thus, one route could not be held at the end to coordinate with the schedule of the other route without adding more vehicles and raising the cost of the service.

### **Route 96: Medford Square – Harvard Station via George St.**

### **Route 101: Malden Center**

### **Station – Sullivan Sq. Station**

In response to a customer request, coordination between the Route 96 and Route 101 schedules was looked at to provide an easier transfer at Medford Square for travel between the Red Line (at Davis Square) and the Orange Line (at Malden Station). Although this is a conceptually good idea, coordination was not recommended as the two routes have different cycle times and different headways. They also share equipment through interlining to save resources. Schedule adjustments that would facilitate a transfer at Medford Square

would require the addition of vehicles, and would raise the cost of the service. In addition, direct connections between the Orange Line and the Red Line can already be made via Routes 86 (Sullivan to Harvard), 91 (Sullivan to Central), and 90 (Sullivan to Davis).

### **Route 101: Malden Center Station – Sullivan Sq. Station**

A request was made for additional Sunday and evening service on the Route 101. The most recent Ridecheck data for this route does not, however, show a demand for more service.

### **Route 105: Malden Center Station – Sullivan Sq. Station**

Route 105 provides service between Malden Station and Sullivan Square. To correct weekday and Saturday Frequency of Service problems, a proposal was evaluated to shorten the headways from 70-minutes to 35-minutes midday on weekdays and from 60/65-minutes to 35-minutes all day on Saturday. This proposal was not recommended due to the cost of implementation and the lack of demonstrated demand for additional midday service.

### **Route 112: Wellington Station – Wood Island Station**

A proposal was considered to add an early trip on Sunday to meet the Frequency of Service standard. This change is not recommended due to the lack of demonstrated demand for additional service and the cost of implementation.

A customer request was made to provide service to the New England Produce Center. Extending the Route 112 to the

center was considered, via a one-way, loop from Spruce St. to Beacham, to Behen, to Market and back to Spruce. This proposal was not recommended, however, due to several drawbacks. Travel into the Produce Center would not be advisable due to heavy traffic and loading dock activities, which would increase running times. Unfortunately, siting a bus stop outside of the Produce Center would also be problematic. There is no suitable bus stop location at the Produce Center entrance on Market St. The closest potential stop would be on Beacham St., beyond the Produce Center entrance. Service is also not recommended, as the roadways adjacent to the Produce Center are in very poor condition. In addition, service to the Produce Center would require the use of additional resources, increasing the Route 112 operating costs.

### **Route 116/117: Eastern Ave**

A review of providing a new service on Eastern Avenue in Chelsea was rejected due to the proximity of existing service, the uncertainty of demand for the new service, and the negative impact on the existing routes.

### **Route 131: Melrose Highlands – Malden Ctr. Station**

In response to customer requests for service from Melrose to the Square One Mall, a midday extension of the Route 131 via Upham Street was considered. This proposal was not recommended for several reasons. To extend service to the mall would require either adding a vehicle, which would greatly increase the cost of the route, or lengthening the midday headways to 75-minutes, which would cause the route to fail the Frequency of Service standard. Although mall service might attract new

riders, it would also inconvenience, and perhaps discourage, existing riders who would be diverted to the mall and back in the middle of their trip. Also, Melrose residents can currently reach the mall by connecting from the Orange Line at Malden Station to the Route 430.

### **Route 132: Redstone Shopping Ctr. – Malden Ctr. Station**

In response to customer a suggestion, a proposal was evaluated to extend the Route 132 from its current terminus at the Redstone Shopping Center in Stoneham for 1.5 miles to Reading by adding one vehicle all day to maintain/improve the present headways. This extension was not recommended for implementation, as it caused the route to fail the Net Cost/Passenger standard.

A request for service every 15-minutes in the afternoon peak was also not recommended, as current ridership does not demonstrate demand for this frequency of service.

### **Route 134: North Woburn – Wellington Station**

A proposal was considered to make the Route 710 North Medford – Medford Square or Meadow Glen Mall (which is currently operated under contract by A & A Metro Transportation) a variation of the Route 134. This could be accomplished by adapting the Route 134 short trips (which currently operate only to the Winchester Town Line) to cover the existing Route 710. The new combined route (134/710) would provide a connection from North Medford to the Orange Line at Wellington Station, but would reduce service on the segment of the Route 134, from which the short trips would be diverted. This proposal was

not recommended, as it would have precluded extension of the Route 134 short trips to Anderson Regional Transportation Center, which provided a much larger potential gain in ridership.

Later service on Route 134 was requested; however, the most recent data collected on this route does not show sufficient demand for later service to justify the increased cost.

### **Route 136/137: Reading Depot – Malden Station**

Two extensions to the Route 136/137, which were requested by customers, were analyzed. One proposal would extend the route to Teradyne in North Reading, and the other would extend the route to Edgewater Office Park near I-95 in Wakefield. The addition of one AM peak and one PM peak trip for each extension was analyzed. These extensions were not recommended, as past experience has shown that extremely low frequency service is generally not a productive use of resources, and the addition of more trips would be too costly.

### **Route 217: Larkin Square Service**

Redirection of Route 217 (Ashmont – Wollaston Station via Wollaston Beach) from Beale Street to Larkin Square and Quarry Street in Quincy was rejected as it would require elimination of service to Wollaston Beach.

### **Route 222: Terminus in East Weymouth**

The issue of truncating route 222 at Jackson Square in East Weymouth will be determined when opportunities for an intermodal interface at the planned East

Weymouth commuter rail station solidify.

### **Route 225: Quincy Ave Retail Complex**

#### **Service to the retail complex at Quincy Avenue and Southern Artery.**

This proposal was rejected for consideration due to gradients and other access constraints, as well as internal circulation and stop placement problems within the site.

### **Route 238: Crown Colony Service to Crown Colony (adjacent Quincy Adams Station).** This proposal was rejected for consideration due to:

- Access constraints (only one entrance/exit roadway)
- Terrain (gradients affecting the ability to serve both Centre Street and Crown Colony effectively without unrealistic routing configurations)
- Building setbacks and concomitant pedestrian access problems
- Potential anticompetitive issues with an existing private carrier service

### **Route 325: Elm St. Medford – Haymarket via I-93**

Based on customer requests, an extension of this route to Post Office Square was analyzed. This change was not recommended, as it would require an additional vehicle to maintain existing headways, which would cause the route to fail the Net Cost/Passenger standard.

Additional later service on Route 325 was also requested. However, the most recent data collected on this route does not show sufficient demand for later service to justify the increased cost.

### **Route 326: West Medford – Haymarket via I-93**

An extension to Post Office Square was analyzed for Route 326. As with Route 325, this extension caused the route to fail the Net Cost/Passenger standard and was therefore not recommended.

A request was made for earlier service on Route 326. However, the route currently meets the Span of Service standard and does not demonstrate sufficient early morning demand to add a trip. Later service on Route 326 was requested as well. The most recent data collected on this route, however, does not show sufficient demand for later service.

### **Route 350: Later Sunday service**

A suggestion was received to run route 350 later on Sundays. Route 350 ran until 9:10pm until June 1998, when it was cut back to 6:50PM due to low ridership. According to a count done just before it was discontinued, adding the two evening trips back would add 12 riders at a cost of \$22 per rider. This is not recommended.

### **Route 351: Bedford – Alewife**

A number of ideas were considered but not recommended regarding Route 351. These include:

- **Running the reverse direction in-service, crossing highway 62 to overlap with route 62:** The MBTA would not be able to run this reliably without adding another bus to the schedule for most of the day, and the projected demand for this new service does not justify doing so.
- **Running the reverse direction in-service, using the Middlesex Turnpike, Lowell Street, and**

**Arlington Heights:** The MBTA would not be able to run this reliably without adding another bus to the schedule for most of the day, and the projected demand for this new service does not justify doing so.

A suggestion was received to divert route 351 from a portion of route 2 and route 128 onto Hayden Ave, Spring Street and Marrett Road in Lexington. This would add about 5 minutes to the trip time. The new service would be on Hayden Ave, an industrial park, and Spring Street and Marrett Road, a residential area. It would also add another connection to the 76.

Adding service to Hayden Ave would probably result in a *loss* of transit ridership in the area. The Route 128 Business Council operates a shuttle from Alewife onto each property on Hayden. If an MBTA bus started serving Hayden Ave, the shuttle would be discontinued. However the MBTA bus could not provide service onto the corporate properties without adding significant delay to existing route 351 riders, so passengers who now enjoy door-to-door service would be faced with a significant walk. This less convenient service would not attract as many riders as the current shuttle does.

Service on Spring Street and Marrett Road would be likely to attract few riders, if any. Route 351 operates from Alewife in the morning and to Alewife in the evening. Spring and Marrett are residential, so the route would only serve people who happened to live on them and work on one of the campuses route 351 serves in Bedford and Burlington, which is likely to be very few people. This leaves the transfer between route 76 and route 351, which already connect at Alewife, and which have schedules that

do not match well. While one or two passengers might benefit from a transfer at this location, this is outweighed by the additional 5 minutes of riding time all existing 351 riders would have to endure.

If the shuttle that serves businesses on Hayden is discontinued this idea should be revisited, however it cannot be recommended at this time.

### **Route 354: Woburn Express – Boston via I-93**

A request for additional service on Route 354 was made to alleviate schedule adherence problems. However, observations since the opening of the Southbound Central Artery show that on-time performance has improved.

### **Route 429: Lynn Fells Parkway**

Redirection of Route 429 from US Highway 1 in Saugus to the Lynn Fells Parkway was rejected due to prohibitions on bus service on parkways. Geometric constraints preclude service to a retail “Power Center” on the parkway near US Highway 1.

### **Route 430: Saugus Center – Malden Center Station**

To meet the Frequency of Service standard on weekdays a proposal was evaluated to add one round-trip, which would smooth out PM peak headways to 30-minutes. This was not recommended due to very low demand for additional PM peak service and the cost of implementation.

### **Route 435: Western Ave service**

A redirection of Route 435 (Liberty Tree Mall – Central Sq., Lynn) from Maple Street to Western Avenue in Lynn was

rejected due to geometric constraints and service reliability issues.

### **Multiple Routes in Salem / Swampscott**

Revising the routing structure in the vicinity of Vinnin Square in Swampscott/Salem was rejected due to spatial and geometric constraints.

### **New Route: Davis Square – Jackson Square**

Based on a recommendation forwarded by an MBTA customer, a new route, from Davis Square to Jackson Square, was evaluated. The theory behind this route was to avoid heavy traffic by coming near to, but not into, a number of activity centers. It was designed to provide connectivity between major regions that presently do not have direct connections, and to follow a street routing that was selected to minimize traffic delays. It would also provide connections to the subway and several major bus routes

The route, as proposed, would travel from Davis Square via Elm St, Beech St, Massachusetts Ave, Somerville Ave, Park St, Beacon St, Hampshire St, Portland St, Albany St, Waverly St, Henry St, Brookline St, BU Bridge, Commonwealth Ave, St Paul Ave, Longwood Ave, and Chapel St to MBTA Longwood station (D line). Then reverse via Chapel and Longwood to Kent St, Washington St, High St, Chestnut St, Perkins St, and Centre St to Jackson Square station.

This proposal was not recommended as it failed the Net Cost/Passenger standard (with a cost of \$10.04/passenger).

### **New Route: Belmont Center - Alewife**

A suggestion was received to start a new route that would connect Belmont to Alewife. This would allow Belmont residents faster access to the Red Line. The route studied would start in Belmont Center and travel on Concord Ave to the Alewife Brook Parkway rotary, where it would take the rotary to Alewife Brook Parkway and then enter Alewife Station. One-way trip time would be 18 minutes.

Modeling showed that if this route were added at a half-hour headway in the AM and PM peaks only it would attract about 700 riders, of whom 500 were diverted from routes 74, 75, and 78, and of whom 200 were new transit riders. Because riders would be diverted from these routes it would make sense to reduce service on them routes to pay for the new route. A reduction in service on those routes sufficient to pay for this new route would result in a net loss of transit ridership. A Belmont Center to Alewife route is not recommended.

### **New Route: Arlington Center – Watertown**

This new route was in response to a customer, requesting service from Arlington to Watertown without customers having to travel through Harvard Square and in response to two other customers requesting service across Belmont with improved connections to Arlington buses. The route would run from Arlington Center to Pleasant Street, Belmont Center, Pleasant Street, Waverley St., Waverly Sq., Lexington St., Orchard St, Common Street and Mt. Auburn Ave. to Watertown Sq.. At minimum service levels to meet frequency and span of service standards, this route would cost

\$1,941 per weekday to operate while attracting an estimated 265 riders. At \$7.33 per passenger, this would fail the net cost per passenger standard. This route is not recommended. Another similar suggestion to provide service in same area between Watertown and Medford was also not recommended due to the increased cost of the additional distance, and only marginal projected increase in ridership.

### **Service to Marina Bay**

Service to the Marina Bay development in Squantum was rejected as it would duplicate a privately-operated minibus shuttle that serves North Quincy Station.

### **New Route: Forest Hills to Harvard Square**

A suggestion was received to form a new route using part of the 39 and part of the 66. Starting at Harvard, the route would travel as the 66 does until it gets to Huntington. Instead of turning left onto Huntington to go to Roxbury Crossing and Dudley as the 66 does, it would turn right to go to the JP Monument and Forest Hills as the 39 does. It was suggested that some service could be taken from the 66 and / or the 39 to help fund this new route.

This route would be longer than either route 39 or 66, and contain parts of each that act as bottlenecks for each route. A route that has parts of each would be likely to have significant reliability problems. Less than half of current riders of route 66 and about 20% of the current riders of route 39 would be able to take this new route and reach the same destination.

The most important question when considering this new route, perhaps, is the number of people transferring between route 39 and 66 now. These are

the passengers who would experience the benefit of the change, and this is a good indicator of what ridership gains we could expect from the new route. In the most recent MBTA Ridership Survey, less than 100 people – 1% of the ridership of route 39, 2% of route 66 – transferred between the routes in each direction. Even a route with frequent service comparable to routes 39 and 66 would be unlikely to more than triple that number to 300 riders. If the route were run at a frequency comparable to the ridership gain it would provide, even if it could be run reliably over such a long distance it would not provide a compelling alternative to the frequent service of routes 39 and 66. For these reasons, this idea is not recommended.

### **New Route: North – South Somerville Service**

A suggestion was received to start a new route with North – South service in Somerville. While there is considerable demand for such service in Somerville, the city has few North – South streets that are appropriate for frequent, reliable bus service. Two streets that are often suggested, Centre and School, are too narrow and too steep for regular service – one poorly parked car could block the route, and the route could not run at all on snowy days. It is hoped that other modifications connecting Winter Hill to the Red Line (see the route 89 proposal) can meet some of the needs that would be met if North – South service were possible. Due to the geometric constraints, this change is not recommended.

## **V. FOR FUTURE CONSIDERATION**

Lynn-area bus service presently serving Logan Airport Terminal C may be

redirected to the new Airport Station after that facility opens in early 2004. This could offer better access to the Massport shuttle bus network, and offer a better Bus/Blue Line link.

## **VI. SERVICE DELIVERY POLICY CHANGE RECOMMENDATIONS**

The MBTA's current *Service Delivery Policy* was developed in 1996 as a joint effort of the MBTA, the Executive Office of Transportation and Construction and the Conservation Law Foundation. The 1996 *Service Delivery Policy* establishes Service Delivery Guidelines against which services are assessed. These include the following:

### **Service Delivery Guidelines**

<b>Guideline</b>	<b>Definition</b>
Coverage	Where should we provide service?
Span of Service	When does service begin and end?
Frequency	How often does service operate?
Schedule Adherence	Does the service run on time?
Loading	How crowded is the service?
Service Productivity	How cost effective is the service to provide? (Bus only)

The 1998 Service Plan was the first such plan that utilized the Service Delivery Guidelines established under the 1996

*Service Delivery Policy*. The 1998 Plan included a comprehensive evaluation of all services using the guidelines in the 1996 policy. Based on this experience, the MBTA proposed a number of modifications to the 1996 *Service Delivery Policy* as a part of the 2002 Service Plan. These modifications were intended to make the policy more useful for evaluating and prioritizing service changes. The MBTA presented all of the proposed policy modifications to the public at meetings that were held as a part of the service plan public process in the fall of 2001. Subsequently, the Service Standards Technical Advisory Committee (which had advised the MBTA on development of the 1996 *Service Delivery Policy*) was reconvened to review and finalize the proposed modifications before presenting them to the MBTA Board of Directors for approval. The Service Standards Technical Advisory Committee (SSTAC) consists of a cross section of advocacy, agency and academic representatives with transit expertise.

The SSTAC recommended adoption of most of the proposed changes—either as they were initially envisioned or with minor modifications. The Board subsequently adopted these changes on December 12, 2002. Since then, the SSTAC has continued to work on additional modifications to the 1996 *Service Delivery Policy* to make it reflect changes in MBTA operations that have occurred since the policy was developed. As a part of this 2004 Service Plan, the MBTA is presenting these additional changes to the public for review. The most important proposed changes deal with the Service Delivery Guidelines, which are covered in Chapter 3 of the *Service Delivery Policy*. However, the

SSTAC is also proposing changes that restructure the first two chapters of the policy. Following is a summary of the proposed changes to the *Service Delivery Policy*. The full text of revised Chapters 1-3 is attached as Appendix C.

During public workshops that were held to solicit ideas for the 2004 Service Plan, a number of concerns were raised by attendees regarding service issues such as bus bunching, headway regulation, early departures, mid-point schedule adherence, and the need for more inspectors to monitor and control bus operations. The changes that are being proposed to the *Service Delivery Policy* will help the MBTA to measure bus performance. In addition, the technologies that will be available on new MBTA buses will greatly enhance our ability to collect and analyze data on the performance of bus services. When the bus central control and dispatch system is fully implemented, the MBTA will have additional means of monitoring and controlling bus operations.

### **1996 Service Delivery Policy – Summary of Proposed Changes**

**Chapter 1:** This chapter now begins with a statement of purpose for the *Service Delivery Policy*. In addition, the background information in Chapter 1 has been updated to reflect the current proposed changes.

**Chapter 2:** This chapter now includes definitions of all types of MBTA services, by mode. Previously, Chapter 3 of the *Service Delivery Policy* referred to different types of services (e.g., local bus, express bus, commuter bus), but did

not explicitly define them. Presenting the definitions enhances the clarity of the policy and provides a means for incorporating standards for Bus Rapid Transit (BRT) into the policy.

When revising the policy, the SSTAC gave considerable thought to the issue of defining Service Delivery Guidelines for BRT. This presented a challenge, as BRT is a hybrid type of service that can operate like rapid transit on one part of a route and similar to local bus service on another part. Because the MBTA has only recently begun operating BRT services, the SSTAC has attempted to create a policy that will be flexible enough to cover future BRT routes as they are implemented, without triggering the need to revise the Service Delivery Guidelines. The proposed solution is to define a new category of service called "Key Bus Routes." The Key Bus concept was advanced during the recent fare increase process, and implementation of this process will begin with some routes in the spring 2004 bus schedule. This policy change represents the formalization of the language and standards that will apply to routes that are labeled key routes.

The Key Bus Route definition will cover the trunk portions of BRT routes and many BRT surface extension routes. The Key Bus definition will also be applied to non-BRT bus routes to recognize the need for higher minimum service requirements for routes in dense urban areas where high ridership and long hours of operation are common. The proposed standards for Key Bus Routes reflect these frequency and span of service expectations.

An addendum to the policy lists the 15 original Key Bus Routes and defines the characteristics that can be used to identify possible new Key Bus Routes in the future. The Key Bus Route list can be edited without amending the *Service Delivery Policy* should additional services be classified as Key Bus Routes.

Chapter 2 also includes a discussion of the MBTA's Service Objectives. The Service Objectives have been revised to relate more directly to the MBTA's mission statement. Together the Service Objectives define the service characteristics that are necessary to achieve the mission of providing premier public transportation services. The Service Standards presented in Chapter 3 are used to measure how well the MBTA is meeting its Service Objectives. The Service Objectives include:

- Accessibility,
- Reliability,
- Safety,
- Comfort, and
- Cost-Effectiveness.

**Chapter 3:** One change that has been made to the Chapter 3 Introduction is a statement that recognized that the Service Planning process might identify important services that cannot be funded within the existing operating budget. These would be considered for future implementation, when sufficient funding is available for inclusion in the budget. This addition is a way to address the concern expressed by the public that the Service Plan is currently constrained by a resource neutral approach.

The proposed changes to Chapter 3 also include revisions to the Service Delivery Guidelines, which are stated as Service

Standards, which should be adhered to, or Service Guidelines, which are not strict threshold requirements.

Following is a summary of each Service Standards/Guidelines as it is presented in the revised Chapter 3, including the changes that were adopted in December 2002, and those that are currently being proposed. In keeping with the revisions to Chapter 2, the Service Standards are now organized so that each is associated with a Service Objective.

#### Accessibility

- **Coverage Guidelines:** Minor changes were made to the Coverage Guidelines to make it explicitly apply to the service area for bus, light rail and heavy rail. This change was made to reflect the enlarged service area, as defined in the MBTA's revised enabling legislation.
- **Span of Service Standard:** Two new changes are being proposed for the Span of Service Standard. One extends the standard to 6:30 PM (from 6:00 PM) for some services to make the Span of Service consistent with the revised Time Period definitions. The other change defines the Span of Service standard for Key Bus Routes:

Mode	Day	Minimum Span
Key Bus	Weekday	6:00 AM – midnight
	Saturday	6:00 AM – midnight
	Sunday	7:00 AM – midnight

- **Frequency of Service Standard:** An integral part of both the Frequency of Service and the Vehicle Load standards is the definition of Time Periods throughout the service day.

Although the Time Periods were revised through the modifications already adopted by the Board, additional changes are being proposed to facilitate incorporation of the Key Bus Routes. The proposed changes to the Time Period definitions are as follows:

Time Period	Proposed Definition
Early AM	6:00 AM – 6:59 AM
AM Peak	7:00 AM – 8:59 AM
Midday Base	9:00 AM – 1:29 PM
Midday School	1:30 PM – 3:59 PM
PM Peak	4:00 PM – 6:29 PM
Evening	6:30 PM – 9:59 PM
Late Evening	10:00 PM – 11:59 PM
Night/Sunrise	12:00 AM – 5:59 AM

### Reliability

- Schedule Adherence Standard:** In December 2002 the Board approved a change to the Schedule Adherence standard that would apply the requirement that 75 percent of bus trips operate on time over the entire service day instead of over each individual time period. This change was intended to make the Schedule Adherence standard more sensitive, as in the past all routes had failed the Schedule Adherence standard. Unfortunately, the Schedule Adherence standard for bus has continued to be problematic.

The SSTAC therefore explored other ways in which to make the bus standard more meaningful for diagnosing on-time performance problems for bus services. The result is the newly proposed bus Schedule Adherence Standards, which evaluate the on-time performance of individual trips on a bus route, and then determine route

on-time performance based on the percent of trips that are on time over the whole service day.

In keeping with the previous Schedule Adherence Standards, which differentiated between frequent and less frequent service, the proposed standard creates two different tests for on-time performance at the trip level.

The new proposal also suggests standards for evaluating mid-route on-time performance for bus routes. These standards anticipate the implementation of CAD/AVL as new buses are added to the fleet. This new technology will allow the MBTA to verify the accuracy of the mid-route time points on the schedule cards, and once the Bus Central Dispatch system has been fully implemented, it will be possible to track real time schedule adherence and to instruct drivers to make headway adjustments if needed.

Trip Test	Beginning of Route	Mid-Route Time Point(s)*	End of Route
Headways $\geq 10$ min:	Start 0 min early to 3 min late	Depart 0 min early to 5 min late	Arrive 3 min early to 5 min late
Headways $< 10$ min:	Start within 25% of scheduled headway	Leave within 50% of scheduled headway	Running time within 20% of scheduled running time
<b>Route Test</b> For any given bus route to be in compliance with a the Schedule Adherence Standard, 75% of all trips on the route must adhere to the above measures over the entire service day.			

## Safety & Comfort

- **Vehicle Load Standard:** The Vehicle Load standard incorporates several changes that were approved by the Board in December 2002, including:
  - Bus routes should be considered non-compliant if average loads violate maximum load guidelines during any 30-minute segment of a peak period or any 60-minute segment of an off-peak period.
  - Express bus routes should follow the same loading guidelines as local buses.
  - Commuter rail lines should permit load levels equal to 110% of seated capacity.
  - The peak load standard should be applied to the Early AM and School periods.

The data in the Vehicle Load standard is also now being presented in a different format. Previously, the policy included information about the seated and max loads for each mode. This has recently become more complicated as the MBTA had purchased a variety of new vehicles, each with a different seating capacity. Therefore, to streamline the policy, information on the seated and max load capacities of vehicles has been removed from the body of the policy and will be included in an addendum. As the fleet turns over, the addendum will be revised to reflect these changes. The policy retains information about the ratio of allowed passengers to seats by mode.

## Cost-Effectiveness

- **Net Cost/Passenger Standard:** One minor change has been made to the Net Cost/Passenger standard. This change reflects current practice,

which allows routes that fail the Net Cost/Passenger standard to be retained if there are extenuating circumstances.

## VII. TITLE VI and ENVIRONMENTAL JUSTICE REVIEWS

In compliance with Title VI, all the changes in this plan were first classified by the route status as minority or non-minority. The result of the recommended proposals is that the level of service standards, as measured by the guidelines in the Service Delivery Policy, is improved for both minority and non-minority routes.

In addition, the Boston Metropolitan Planning Organization (MPO) has adopted the following definition of environmental justice:

*"Environmental Justice requires the MPO to:*

- *examine the allocation of benefits and burdens, currently and in the planned future,*
- *ensure that minority and low-income communities are treated equitably in the provision of transportation services and projects, and*
- *provide full participation for minority and low-income communities to advise the MPO during its planning and decision-making process.*

*The examination of Environmental Justice will include consideration of patterns of capital investment and allocation that have contributed to present conditions and inform current and future MPO decisions."*

The Boston MPO uses the following measures to assess environmental justice aspects of transit services:

- vehicle load
- frequency of service
- schedule adherence
- transit amenities (including shelter availability)
- vehicle assignment (age, air conditioning, emissions profile)

For most measures, the available data tends to confirm that the MBTA is treating minority and low-income communities equitably in the provision of transportation services. A complete assessment of the environmental justice review completed to date can be found in the *Boston MPO Transportation Plan 2000-2025*.

## **APPENDIX A:**

**Summary Analysis of  
Routes and Proposed  
Changes**

### Weekday bus service, current and proposed

"X"=failed, "I"=failed but improved

Route number	Description	Current						Standards			Proposed						Standards			Change										
		Peak Hours	Off peak hours	Total hours	Miles	Total cost	Ridership	Span	Frequency	Loading	Sched.	Adher.	Net cost/pax.	Type of change	Peak Hours	Off peak hours	Total hours	Miles	Total cost	Ridership	Span	Frequency	Loading	Sched.	Adher.	Net cost/pax.	Peak Hours	Off peak hours	Total hours	Miles
1	Harvard - Dudley Sta. via Mass. Ave.	48.1	112.7	160.8	1138	\$14,641	12557	\$0.48	\$0.69	X	X	Minor	48.1	115.3	163.4	1158	\$14,849	12647	\$0.69	I	0.0	2.6	2.6	20	90	1				
3	City Point - Chinatown via BMIPK	6.1	3.6	9.7	101	\$1,109	284	\$0.48	\$3.43	X	Major	0.0	0.0	0.0	0	-\$1	0	\$0.00		-6.1	-3.6	-9.7	-101	-284	3					
4	North Station - World Trade Ctr.	13.0	1.8	14.8	70	\$1,606	259	\$0.48	\$5.72	X	X	Minor	11.3	1.8	13.1	71	\$1,438	308	\$4.19	X	-1.7	0.0	-1.7	1	49	4				
5	City Point - McCormack Housing	0.3	6.3	6.6	38	\$505	148	\$0.48	\$2.93	X	X	Minor	0.3	6.3	6.6	38	\$505	148	\$2.93	X	I	0.0	0.0	0.0	0	0	5			
6	Boston Marine Ind Park - Haymarket	7.3	6.3	13.6	119	\$1,442	334	\$0.48	\$3.84	X	X	Major	3.9	3.7	7.6	51	\$753	97	\$7.29	X	I	X	-3.4	-2.6	-6.0	-69	-237	6		
7	City Point - Otis & Summer Sts.	31.7	43.0	74.7	551	\$7,256	2568	\$0.48	\$2.35	X	X	Major	29.2	43.0	72.2	551	\$7,005	2577	\$2.24	I	-2.5	0.0	-2.5	0	9	7				
8	Harbor Point /U Mass - Kenmore Sta.	45.5	75.2	120.7	1022	\$11,857	5039	\$0.48	\$1.87	X	X	Major	48.5	75.2	123.7	1027	\$12,173	5039	\$1.94	I	3.0	0.0	3.0	5	0	8				
9	City Point - Copley Sq. via Broadway	30.7	55.8	86.5	684	\$8,279	4628	\$0.48	\$1.31	X	X	Minor	30.7	56.8	87.5	692	\$8,361	4660	\$1.31	I	0.0	1.0	1.0	8	32	9				
10	City Point - Copley Sq. Via Boston Med. Ctr.	22.6	50.7	73.4	504	\$6,666	3317	\$0.48	\$1.53	X	Minor	22.6	50.7	73.4	504	\$6,666	3317	\$1.53	I	0.0	0.0	0.0	0	0	10					
11	City Point - Downtown via Bayview	22.4	48.6	71.0	637	\$6,892	2789	\$0.48	\$1.99	X	Major	28.5	52.2	80.7	734	\$7,991	2867	\$2.31	X	6.1	3.6	9.7	98	78	11					
14	Roslindale Square - Heath Street Station *	12.0	24.4	36.4	426	\$3,837	1425	\$0.48	\$2.21	X	None	12.0	24.4	36.4	426	\$3,837	1425	\$2.21		0.0	0.0	0.0	0	0	14					
15	Kane Sq. - Ruggles Sta.	29.2	64.5	93.7	709	\$8,710	6779	\$0.48	\$0.80	X	X	Minor	29.2	64.5	93.7	709	\$8,710	6779	\$0.80	I	0.0	0.0	0.0	0	0	15				
16	Forest Hills Sta. - U Mass.	22.0	42.3	64.3	646	\$6,510	4832	\$0.48	\$0.87	X	X	Minor	22.0	42.3	64.3	646	\$6,510	4832	\$0.87	I	0.0	0.0	0.0	0	0	16				
17	Fields Corner Sta. - Andrew Sta.	15.5	30.9	46.4	321	\$4,270	3741	\$0.48	\$0.66	X	Minor	15.5	30.9	46.4	321	\$4,270	3741	\$0.66	I	0.0	0.0	0.0	0	0	17					
18	Ashmont Sta. - Andrew Sta.	7.4	11.0	18.4	157	\$1,827	688	\$0.48	\$2.18	X	X	Minor	7.4	11.0	18.4	157	\$1,827	688	\$2.18	X	I	0.0	0.0	0.0	0	0	18			
19	Fields Corner Sta. - Ruggles Sta.	13.7	16.6	30.2	236	\$3,010	2058	\$0.48	\$0.98	X	X	Major	13.9	16.9	30.7	243	\$3,068	2241	\$0.89	I	0.2	0.3	0.5	7	183	19				
20	Fields Corner Sta. - Fields Corner Sta.	12.0	27.8	39.8	374	\$3,888	1489	\$0.48	\$2.13	X	None	12.0	27.8	39.8	374	\$3,888	1489	\$2.13	X	0.0	0.0	0.0	0	0	20					
21	Ashmont Sta. - Forest Hills Sta.	16.7	29.4	46.1	437	\$4,634	4147	\$0.48	\$0.64	X	None	16.7	29.4	46.1	437	\$4,634	4147	\$0.64	X	0.0	0.0	0.0	0	0	21					
22	Ashmont Sta. - Ruggles Sta. via Jackson	41.0	76.7	117.7	1080	\$11,661	8349	\$0.48	\$0.92	X	None	41.0	76.7	117.7	1080	\$11,661	8349	\$0.92	I	0.0	0.0	0.0	0	0	22					
23	Ashmont Sta. - Ruggles Sta. via Wash.	55.0	119.1	174.1	1327	\$16,240	12910	\$0.48	\$0.78	X	X	None	55.0	119.1	174.1	1327	\$16,240	12910	\$0.78	I	0.0	0.0	0.0	0	0	23				
24	Wakefield Ave. - Mattapan Sta.	8.9	21.6	30.5	274	\$2,933	1629	\$0.48	\$1.32	X	Moderate	8.9	22.4	31.3	288	\$3,019	1658	\$1.34	X	0.0	0.8	0.8	14	29	24					
26	Ashmont Sta. - Norfolk & Wash. Belt	8.0	20.3	28.3	231	\$2,645	1829	\$0.48	\$0.97	X	Minor	8.0	20.8	28.8	246	\$2,716	1847	\$0.99	X	0.0	0.5	0.5	15	18	26					
27	Mattapan Sta. - Ashmont Sta.	4.0	7.0	11.0	93	\$1,073	578	\$0.48	\$1.38	X	X	Moderate	4.0	6.6	10.6	89	\$1,037	563	\$1.36	X	X	0.0	-0.4	-0.4	-5	-15	27			
28	Mattapan Sta. - Ruggles Sta. via Dudley	54.7	122.1	176.8	1381	\$16,539	12041	\$0.48	\$0.89	X	None	54.7	122.1	176.8	1381	\$16,539	12041	\$0.89	X	0.0	0.0	0.0	0	0	28					
29	Mattapan Sta. - Ruggles Sta.	17.0	28.2	45.2	409	\$4,514	2237	\$0.48	\$1.54	X	Minor	17.0	28.2	45.2	409	\$4,514	2237	\$1.54	X	0.0	0.0	0.0	0	0	29					
30	Mattapan Sta. - Roslindale Sq.	10.3	27.6	37.9	348	\$3,631	1938	\$0.48	\$1.39	X	Moderate	12.3	28.5	40.8	376	\$3,965	2028	\$1.48	X	2.0	0.9	2.9	28	90	30					
31	Mattapan Sta. - Forest Hills Sta.	21.2	48.7	69.9	693	\$6,939	4955	\$0.48	\$0.92	X	None	21.2	48.7	69.9	693	\$6,939	4955	\$0.92	X	0.0	0.0	0.0	0	0	31					
32	Cleary Sq. - Forest Hills Sta.	34.0	71.7	105.6	1179	\$10,936	8218	\$0.48	\$0.85	X	Moderate	36.0	71.7	107.6	1201	\$11,200	8218	\$0.88	X	2.0	0.0	2.0	22	0	32					
33	River & Milton Sts. - Mattapan Sta.	7.8	12.0	19.7	224	\$2,113	871	\$0.48	\$1.95	X	Minor	8.8	12.0	20.7	228	\$2,225	914	\$1.95	X	1.0	0.0	1.0	4	43	33					
34E	Walpole Center - Forest Hills Sta.	23.4	62.1	85.5	1061	\$8,988	3182	\$0.76	\$2.06	X	Minor	23.4	62.1	85.5	1061	\$8,988	3182	\$2.06	X	0.0	0.0	0.0								

### Weekday bus service, current and proposed

"X"=failed, "I"=failed but improved

Route number	Description	Current						Standards		Proposed						Standards		Change													
		Peak Hours	Off peak hours	Total hours	Miles	Total cost	Ridership	Span	Frequency	Loading	Sched.	Adher.	Net cost/pax.	Type of change	Peak Hours	Off peak hours	Total hours	Miles	Total cost	Ridership	Span	Frequency	Loading	Sched.	Adher.	Net cost/pax.	Peak Hours	Off peak hours	Total hours	Miles	Ridership
70A No. Waltham-University Pk., Camb.		16.4	23.8	40.2	465	\$4,352	1790	\$0.48	\$1.95	X	X	X	Minor	16.4	23.8	40.2	465	\$4,352	1790	\$1.95	X	I				0.0	0.0	0.0	0	0	70A
71 Watertown Sq. - Harvard Subway		29.3	68.3	97.7	868	\$8,828	4823	\$0.48	\$1.35	X	Minor	29.3	67.3	96.7	860	\$8,753	4818	\$1.34	X		0.0	-1.0	-1.0	-8	-5	71					
72 Aberdeen & Mt. Auburn - Bennett St. Alley		8.0	19.7	27.7	244	\$2,484	777	\$0.48	\$2.72	X	None	8.0	19.7	27.7	244	\$2,484	777	\$2.72	X		0.0	0.0	0.0	0	0	72					
73 Waverley Sq. - Harvard Subway		51.3	80.3	131.6	1240	\$12,568	5776	\$0.48	\$1.70	X	None	51.3	80.3	131.6	1240	\$12,568	5776	\$1.70	X		0.0	0.0	0.0	0	0	73					
74 Belmont Center - Bennett St. Alley		8.0	19.2	27.2	297	\$2,768	1239	\$0.48	\$1.75	X	None	8.0	19.2	27.2	297	\$2,768	1239	\$1.75	X		0.0	0.0	0.0	0	0	74					
75 Belmont Center - Bennett St. Alley		4.0	7.0	11.0	121	\$1,152	420	\$0.48	\$2.26	X	X	X	None	4.0	7.0	11.0	121	\$1,152	420	\$2.26	X	X	X			0.0	0.0	0.0	0	0	75
76 Hanscom Air Base - Alewife Sta.		11.4	19.9	31.3	610	\$4,033	626	\$0.76	\$5.68	X	X	Moderate	11.5	20.0	31.5	610	\$4,049	646	\$5.51	X	I	0.1	0.1	0.2	0	20	76				
77 Arlington Heights - Bennett St. Alley		49.9	107.5	157.4	1475	\$15,472	7595	\$0.48	\$1.56	X	Moderate	44.3	107.5	151.8	1443	\$14,820	7587	\$1.47	X		-5.6	0.0	-5.6	-32	-8	77					
78 Arlington Village - Bennett St. Alley		16.0	37.1	53.1	624	\$5,542	1547	\$0.48	\$3.10	X	None	16.0	37.1	53.1	624	\$5,542	1547	\$3.10	X		0.0	0.0	0.0	0	0	78					
79 Arlington Heights - Alewife Sta.		17.5	25.5	43.1	373	\$4,308	1579	\$0.48	\$2.25	X	None	17.5	25.5	43.1	373	\$4,308	1579	\$2.25	X		0.0	0.0	0.0	0	0	79					
80 Arlington Center - Lechmere Sta.		17.0	33.4	50.4	489	\$5,049	2095	\$0.48	\$1.93	X	None	17.0	33.4	50.4	489	\$5,049	2095	\$1.93	X		0.0	0.0	0.0	0	0	80					
83 Rindge Ave. - Central Sq., Camb.		15.5	29.9	45.4	333	\$4,242	2840	\$0.48	\$1.01	X	None	15.5	29.9	45.4	333	\$4,242	2840	\$1.01	X		0.0	0.0	0.0	0	0	83					
84 Arlington Loop - Alewife Sta.		4.9	1.7	6.5	86	\$832	221	\$0.48	\$3.28	X	Moderate	3.5	1.9	5.3	64	\$641	203	\$2.68	X	X	-1.4	0.2	-1.2	-22	-18	84					
85 Spring Hill - Kendall Sta.		4.0	8.6	12.6	91	\$1,163	402	\$0.48	\$2.41	X	Moderate	4.0	7.6	11.6	82	\$1,078	405	\$2.18	X		0.0	-1.0	-1.0	-9	3	85					
86 Sullivan Sta. - Cleveland Circle		27.6	51.9	79.5	671	\$7,701	5139	\$0.48	\$1.02	X	X	Moderate	29.4	54.9	84.3	671	\$8,058	5194	\$1.07	X	I	1.8	3.0	4.8	0	55	86				
87 Clarendon Hill - Lechmere Sta. via Som.		18.7	38.7	57.4	540	\$5,668	3720	\$0.48	\$1.04	X	Minor	18.7	39.6	58.3	545	\$5,735	3732	\$1.06	X		0.0	0.9	0.9	5	12	87					
88 Clarendon Hill - Lechmere Sta Via Hglnd		21.0	38.8	59.9	464	\$5,694	4299	\$0.48	\$0.84	X	None	21.0	38.8	59.9	464	\$5,694	4299	\$0.84	X		0.0	0.0	0.0	0	0	88					
89 Clarendon Hill - Sullivan Sta.		22.6	31.9	54.5	422	\$5,332	3586	\$0.48	\$1.01	X	Moderate	22.6	31.9	54.5	412	\$5,303	3811	\$0.91	X		0.0	0.0	0.0	-10	225	89					
90 Davis Sq. Sta. - Wellington Sta.		7.6	17.5	25.0	251	\$2,490	1280	\$0.48	\$1.47	X	X	None	7.6	17.5	25.0	251	\$2,490	1280	\$1.47	X	X	0.0	0.0	0.0	0	0	90				
91 Sullivan Sta. - Central Sq. (Cambridge)		8.0	22.2	30.2	207	\$2,684	1482	\$0.48	\$1.33	X	None	8.0	22.2	30.2	207	\$2,684	1482	\$1.33	X		0.0	0.0	0.0	0	0	91					
92 Sullivan Sta. - Franklin & Arch Sts.		17.0	23.5	40.6	297	\$3,927	1286	\$0.48	\$2.57	X	Minor	17.0	23.5	40.6	297	\$3,927	1286	\$2.57	X		0.0	0.0	0.0	0	0	92					
93 Sullivan Sta. - Franklin & Arch Sts.		37.4	41.0	78.3	580	\$7,789	4629	\$0.48	\$1.20	X	X	Minor	37.4	41.0	78.3	580	\$7,789	4629	\$1.20	X	X	0.0	0.0	0.0	0	0	93				
94 Medford Sq. - Davis Sq. Sta.		9.2	21.6	30.8	328	\$3,114	1343	\$0.48	\$1.84	X	Minor	9.2	21.6	30.8	328	\$3,114	1343	\$1.84	I		0.0	0.0	0.0	0	0	94					
95 West Medford - Sullivan Sta.		12.0	27.0	39.0	431	\$4,001	1679	\$0.48	\$1.90	X	None	12.0	27.0	39.0	431	\$4,001	1679	\$1.90	X		0.0	0.0	0.0	0	0	95					
96 Medford Sq - Bennett St Alley via George		13.4	28.0	41.4	371	\$4,030	1458	\$0.48	\$2.28	X	Minor	13.4	28.0	41.4	371	\$4,030	1458	\$2.28	I		0.0	0.0	0.0	0	0	96					
97 Malden Sta. - Wellington Sta.		6.8	10.6	17.4	144	\$1,712	535	\$0.48	\$2.72	X	Minor	6.8	10.6	17.4	144	\$1,712	535	\$2.72	X		0.0	0.0	0.0	0	0	97					
99 N.E. Memorial Hosp. - Malden Center		11.0	26.3	37.3	361	\$3,663	1681	\$0.48	\$1.70	X	None	11.0	26.3	37.3	361	\$3,663	1681	\$1.70	X		0.0	0.0	0.0	0	0	99					
100 Elm St. & Fellsway - Wellington Sta.		6.9	15.3	22.1	249	\$2,288	955	\$0.48	\$1.92	X	Minor	6.9	15.3	22.1	249	\$2,288	955	\$1.92	X		0.0	0.0	0.0	0	0	100					
101 Fellsway Garage - Sullivan Sta.		26.7	41.2	67.9	643	\$6,909	4323	\$0.48	\$1.12	X	Minor	26.7	41.2	67.9	643	\$6,909	4323	\$1.12	I		0.0	0.0	0.0	0	0	101					
104 Malden Ctr. Sta. - Sullivan Sta. via Ferry		16.7	31.5	48.2	441	\$4,766	3360	\$0.48	\$0.94	X	Minor	16.7	31.5	48																	

### Weekday bus service, current and proposed

"X"=failed, "I"=failed but improved

Route number	Description	Current						Standards				Proposed						Standards				Change				Route number				
		Peak Hours	Off peak hours	Total hours	Miles	Total cost	Ridership	Average fare	Avg. cost / pax	Span	Frequency	Loading	Sched. Adher.	Net cost/pax.	Type of change	Peak Hours	Off peak hours	Total hours	Miles	Total cost	Ridership	Avg. cost / pax	Span	Frequency	Loading	Sched. Adher.	Net cost/pax.	Peak Hours	Off peak hours	Total hours
236 Quincy Ctr. Sta. - South Shore Plaza		6.8	12.0	18.8	226	\$2,027	411	\$0.48	\$4.45	X	X	X	Moderate	6.8	12.0	18.8	226	\$2,027	478	\$3.76	X	X	X		0.0	0.0	0.0	0	67	236
238 Quincy Ctr. Sta. - West St. & Willard St.		13.7	30.2	43.9	594	\$4,823	1518	\$0.76	\$2.42	X			None	13.7	30.2	43.9	594	\$4,823	1518	\$2.42	X				0.0	0.0	0.0	0	0	238
240 Crawford Sq. - Ashmont Sta.		21.1	37.3	58.4	987	\$7,093	2194	\$0.76	\$2.47	X			None	21.1	37.3	58.4	987	\$7,093	2194	\$2.47	X				0.0	0.0	0.0	0	0	240
245 Quincy Ctr. Sta. - Mattapan Sta.		7.9	10.1	17.9	213	\$1,983	501	\$0.48	\$3.48	X	X		Minor	7.9	10.1	17.9	213	\$1,983	514	\$3.38	X	X			0.0	0.0	0.0	0	13	245
275 Downtown Boston - Long Island		4.0	9.3	13.3	288	\$1,759	235	\$0.00	\$7.49				None	4.0	9.3	13.3	288	\$1,759	235	\$7.49					0.0	0.0	0.0	0	0	275
276 Boston City Hosp. - Long Island Hosp.		6.3	7.5	13.7	230	\$1,719	598	\$0.00	\$2.87				None	6.3	7.5	13.7	230	\$1,719	598	\$2.87					0.0	0.0	0.0	0	0	276
277 L. Shattuck Hosp. - Downtown Boston		0.7	0.0	0.7	6	\$84	0	\$0.00	\$0.00				Minor	0.5	-0.3	0.2	6	\$47	0	\$0.00					-0.2	-0.3	-0.5	0	0	277
325 Elm St. & Feilsway West - Haymarket Sq.		15.3	4.2	19.4	279	\$2,570	359	\$1.50	\$5.66	X	X		Minor	12.3	4.2	16.4	222	\$2,107	315	\$5.19	X	I			-3.0	0.0	-3.0	-57	-44	325
326 West Medford - Haymarket Sq.		14.6	4.2	18.7	267	\$2,464	467	\$1.50	\$3.78	X			None	14.6	4.2	18.7	267	\$2,464	467	\$3.78	X				0.0	0.0	0.0	0	0	326
350 Burlington - Alewife Sta.		19.2	33.8	53.0	739	\$5,996	1537	\$0.76	\$3.14	X			None	19.2	33.8	53.0	739	\$5,996	1537	\$3.14	X				0.0	0.0	0.0	0	0	350
351 Oak Park - Alewife Sta. v Middlese0 Tnpk.		5.6	3.3	8.8	235	\$1,415	238	\$1.50	\$4.45				Moderate	7.0	3.5	10.4	267	\$1,660	320	\$3.69					1.4	0.2	1.6	33	82	351
352 Burlington - State St. via I-95 & I-93		10.6	5.6	16.2	365	\$2,427	484	\$2.28	\$2.74				None	10.6	5.6	16.2	365	\$2,427	484	\$2.74					0.0	0.0	0.0	0	0	352
354 Woburn Line - State Street		18.4	19.5	37.9	759	\$5,140	819	\$2.28	\$4.00				None	18.4	19.5	37.9	759	\$5,140	819	\$4.00					0.0	0.0	0.0	0	0	354
355 Mishawum Station-Boston		1.8	1.4	3.2	52	\$406	13	\$2.28	\$28.98	X	X	X	Minor	1.6	0.9	2.5	40	\$322	10	\$29.92	X	X	X		-0.2	-0.5	-0.7	-12	-3	355
411 Granada Highlands - Malden Ctr. Sta.		6.0	16.8	22.8	282	\$2,377	816	\$0.48	\$2.43				Minor	6.0	16.8	22.8	282	\$2,377	816	\$2.43					0.0	0.0	0.0	0	0	411
430 Saugus, Appleton St. - Malden Ctr. Sta.		8.7	19.1	27.7	385	\$3,073	820	\$0.48	\$3.27	X	X	X	None	8.7	19.1	27.7	385	\$3,073	820	\$3.27	X				0.0	0.0	0.0	0	0	430
500 Riverside Sta. - Federal & Franklin Sts.		14.5	13.6	28.0	667	\$4,136	746	\$2.28	\$3.26	X			Minor	11.1	12.0	23.0	586	\$3,470	651	\$3.05					-3.4	-1.6	-5.0	-82	-95	500
501 Brighton Ctr. - Federal & Franklin Sts.		33.0	14.5	47.5	899	\$6,712	2268	\$1.50	\$1.46	X	X		Minor	33.0	15.6	48.6	919	\$6,831	2284	\$1.49	I				0.0	1.1	1.1	19	16	501
502 Watertown Sq. - Copley Sq.		20.8	5.1	26.0	446	\$3,656	1445	\$1.50	\$1.03	X			None	20.8	5.1	26.0	446	\$3,656	1445	\$1.03					0.0	0.0	0.0	0	0	502
503 Brighton Center - Copley Square		0.0	0.0	0.0	0	\$0	0	\$1.50	\$0.00				Major	7.3	0.0	7.3	169	\$1,212	330	\$2.17					7.3	0.0	7.3	169	330	503
504 Watertown Sq. - Federal & Franklin Sts.		29.7	24.6	54.3	941	\$7,090	1984	\$1.50	\$2.07	X	X		None	29.7	24.6	54.3	941	\$7,090	1984	\$2.07	X				0.0	0.0	0.0	0	0	504
505 Waltham Center - Federal & Franklin Sts.		27.4	16.6	44.0	932	\$6,366	1317	\$2.28	\$2.55	X			Minor	28.4	16.6	45.0	932	\$6,467	1317	\$2.63					1.0	0.0	1.0	0	0	505
553 Roberts - Federal & Franklin Sts.		9.7	19.5	29.2	447	\$3,379	791	\$1.20	\$3.07	X	X		None	9.7	19.5	29.2	447	\$3,379	791	\$3.07	X	X			0.0	0.0	0.0	0	0	553
554 Waverley Sq. - Federal & Franklin Sts.		9.9	18.9	28.8	473	\$3,438	738	\$1.20	\$3.46	X	X	X	None	9.9	18.9	28.8	473	\$3,438	738	\$3.46	X	X			0.0	0.0	0.0	0	0	554
556 Waltham Highlands - Federal & Franklin Sts.		9.0	10.7	19.6	275	\$2,302	486	\$1.20	\$3.54	X	X		Minor	9.0	10.7	19.6	275	\$2,302	486	\$3.54	X				0.0	0.0	0.0	0	0	556
558 Auburndale - Federal & Franklin Sts.		7.5	7.6	15.1	244	\$1,890	391	\$1.20	\$3.63	X	X		Minor	7.9	8.1	16.0	272	\$2,039	402	\$3.87	X				0.4	0.5	0.9	28	11	558
CT1 Central Sq. - So. End Medical Area		16.0	22.5	38.5	248	\$3,622	2507	\$0.42	\$1.02	X			Minor	16.0	23.2	39.2	254	\$3,681	2526	\$1.04	I				0.0	0.7	0.7	6	19	CT1
CT3 Longwood Medical Area - Andrew Sta.		13.4	20.8	34.2	254	\$3,283	1029	\$0.42	\$2.77	X			Minor	13.4	22.5	35.9	274	\$3,439</td												

**Saturday bus service, current and proposed**

"X"=failed, "I"=failed but improved

Route number	Description	Current						Standards		Proposed						Standards		Change			Route number										
		Hours	Miles	Total cost	Ridership	Average fare	Avg. cost / pax	Span	Frequency	Loading	Sched. Adher.	Net cost/pax.	Type of change	Hours	Miles	Total cost	Ridership	Avg. cost / pax	Span	Frequency	Loading	Sched. Adher.	Net cost/pax.	Hours	Miles	Ridership					
1 Harvard - Dudley Sta. via Mass. Ave.		136.7	1010	\$10,847	8939	\$0.48	\$0.73	X	X	X	Minor	136.7	1010	\$10,847	8939	\$0.73	I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1					
5 City Point - McCormack Housing		6.1	35	\$454	158	\$0.48	\$2.40	X	X	X	None	6.1	35	\$454	158	\$2.40	X	X	I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5			
7 City Point - Otis & Summer Sts.		29.5	246	\$2,418	405	\$0.48	\$5.49	X	X	X	Major	19.5	162	\$1,596	322	\$4.48	I	-10.0	-84.0	-83.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7		
8 Harbor Point /U Mass - Kenmore Sta.		45.1	460	\$3,939	1121	\$0.48	\$3.03	X	None	45.1	460	\$3,939	1121	\$3.03	I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8		
9 City Point - Copley Sq. via Broadway		50.3	438	\$4,180	2105	\$0.48	\$1.51	X	None	50.3	438	\$4,180	2105	\$1.51	I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9		
10 City Point - Copley Sq. Via Boston Med. Ctr.		50.9	393	\$4,088	1718	\$0.48	\$1.90	X	None	50.9	393	\$4,088	1718	\$1.90	I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10		
11 City Point - Downtown via Bayview		50.7	463	\$4,271	1510	\$0.48	\$2.35	X	None	50.7	463	\$4,271	1510	\$2.35	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11		
14 Roslindale Square - Heath Street Station *		33.3	388	\$3,044	901	\$0.48	\$2.90	X	None	33.3	388	\$3,044	901	\$2.90	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14			
15 Kane Sq. - Ruggles Sta.		55.5	456	\$4,531	3875	\$0.48	\$0.69	X	X	Minor	55.5	456	\$4,531	3875	\$0.69	X	I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15					
16 Forest Hills Sta. - U Mass.		32.8	335	\$2,866	2092	\$0.48	\$0.89	X	Minor	32.8	335	\$2,866	2092	\$0.89	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16		
17 Fields Corner Sta. - Andrew Sta.		29.3	263	\$2,457	2132	\$0.48	\$0.67	X	Minor	29.3	263	\$2,457	2132	\$0.67	I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17		
18 Ashmont Sta. - Andrew Sta.		9.7	84	\$807	220	\$0.48	\$3.19	X	X	Minor	9.7	84	\$807	220	\$3.19	X	I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18
20 Fields Corner Sta. - Fields Corner Sta.		26.8	265	\$2,314	609	\$0.48	\$3.32	X	Major	26.8	265	\$2,314	623	\$3.23	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20		
21 Ashmont Sta. - Forest Hills Sta.		13.3	131	\$1,149	987	\$0.48	\$0.68	None	13.3	131	\$1,149	987	\$0.68	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21			
22 Ashmont Sta. - Ruggles Sta. via Jackson		86.5	813	\$7,357	4960	\$0.48	\$1.00	X	Minor	86.5	813	\$7,357	4960	\$1.00	I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22		
23 Ashmont Sta. - Ruggles Sta. via Wash.		98.1	900	\$8,281	6903	\$0.48	\$0.72	X	Minor	98.1	900	\$8,281	6903	\$0.72	I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23		
24 Wakefield Ave. - Mattapan Sta.		19.8	191	\$1,700	615	\$0.48	\$2.28	X	Moderate	21.8	249	\$1,981	643	\$2.60	X	2.0	58.0	28.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24				
26 Ashmont Sta. - Norfolk & Wash. Belt		20.3	164	\$1,650	1075	\$0.48	\$1.05	X	Minor	20.8	170	\$1,696	1083	\$1.09	X	0.5	6.0	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26				
27 Mattapan Sta. - Ashmont Sta.		13.2	118	\$1,106	444	\$0.48	\$2.01	X	Moderate	10.7	91	\$884	407	\$1.69	X	-2.5	-27.0	-37.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27				
28 Mattapan Sta. - Ruggles Sta. via Dudley		128.4	1214	\$10,939	10744	\$0.48	\$0.54	X	None	128.4	1214	\$10,939	10744	\$0.54	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28		
29 Mattapan Sta. - Ruggles Sta.		14.7	170	\$1,339	813	\$0.48	\$1.17	X	None	14.7	170	\$1,339	813	\$1.17	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29		
30 Mattapan Sta. - Roslindale Sq.		19.7	196	\$1,704	705	\$0.48	\$1.94	X	None	19.7	196	\$1,704	705	\$1.94	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30		
31 Mattapan Sta. - Forest Hills Sta.		43.8	445	\$3,820	3047	\$0.48	\$0.77	X	None	43.8	445	\$3,820	3047	\$0.77	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31		
32 Cleary Sq. - Forest Hills Sta.		63.2	732	\$5,766	4157	\$0.48	\$0.91	X	None	63.2	732	\$5,766	4157	\$0.91	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	32		
33 River & Milton Sts. - Mattapan Sta.		12.7	141	\$1,138	311	\$0.48	\$3.18	X	Minor	12.7	141	\$1,138	311	\$3.18	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33		
34E Walpole Center - Forest Hills Sta.		59.8	758	\$5,637	2157	\$0.76	\$1.85	X	Minor	59.8	758	\$5,637	2157	\$1.85	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34E		
34 Dedham Line - Forest Hills Sta.		29.9	357	\$2,754	1470	\$0.48	\$1.39	X	None	29.9	357	\$2,754	1470	\$1.39	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34		
35 Dedham Mall - Forest Hills Sta.		28.6	321	\$2,576	1228	\$0.48	\$1.62	X	None	28.6	321	\$2,576																			

### Saturday bus service, current and proposed

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Route number	Description	Current					Standards					Proposed					Standards					Change			Route number				
		Hours	Miles	Total cost	Ridership	Average fare	Avg. cost / pax	Span	Frequency	Loading	Sched. Adher.	Net cost/pax.	Type of change	Hours	Miles	Total cost	Ridership	Avg. cost / pax	Span	Frequency	Loading	Sched. Adher.	Net cost/pax.	Hours	Miles	Ridership			
75 Belmont Center - Bennett St. Alley		10.0	112	\$902	306	\$0.48	\$2.47	X	X	None	10.0	112	\$902	306	\$2.47	X	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	75				
77 Arlington Heights - Bennett St. Alley		124.7	1184	\$10,636	5264	\$0.48	\$1.54	X	None	124.7	1184	\$10,636	5264	\$1.54	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	77					
78 Arlmont Village - Bennett St. Alley		20.8	272	\$1,984	410	\$0.48	\$4.36	X	None	20.8	272	\$1,984	410	\$4.36	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	78					
80 Arllington Center - Lechmere Sta.		32.3	361	\$2,908	1257	\$0.48	\$1.83	X	None	32.3	361	\$2,908	1257	\$1.83	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	80					
83 Rindge Ave. - Central Sq., Camb.		28.6	247	\$2,372	1328	\$0.48	\$1.31	X	None	28.6	247	\$2,372	1328	\$1.31	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	83					
86 Sullivan Sta. - Cleveland Circle		43.7	401	\$3,690	1921	\$0.48	\$1.44	X	Moderate	46.7	401	\$3,865	1991	\$1.46	X	3.0	0.0	70.0	0.0	0.0	0.0	0.0	0.0	86					
87 Clarendon Hill - Lechmere Sta. via Som.		38.7	383	\$3,346	2292	\$0.48	\$0.98	X	Moderate	48.9	504	\$4,284	2667	\$1.13	X	10.2	121.0	375.0	I	0.0	0.0	0.0	0.0	0.0	87				
88 Clarendon Hill - Lechmere Sta Via Hlnd		36.7	338	\$3,100	2257	\$0.48	\$0.89	X	None	36.7	338	\$3,100	2257	\$0.89	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	88					
89 Clarendon Hill - Sullivan Sta.		25.9	230	\$2,163	1573	\$0.48	\$0.90	X	Moderate	25.9	225	\$2,149	1685	\$0.80	X	0.0	-5.1	112.0	I	0.0	0.0	0.0	0.0	0.0	89				
90 Davis Sq. Sta. - Wellington Sta.		14.9	168	\$1,347	698	\$0.48	\$1.45	X	None	14.9	168	\$1,347	698	\$1.45	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	90					
91 Sullivan Sta. - Central Sq. (Cambridge)		27.4	240	\$2,279	1391	\$0.48	\$1.16	X	None	27.4	240	\$2,279	1391	\$1.16	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	91					
92 Sullivan Sta. - Franklin & Arch Sts.		25.0	203	\$2,036	790	\$0.48	\$2.10	X	None	25.0	203	\$2,036	790	\$2.10	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	92					
93 Sullivan Sta. - Franklin & Arch Sts.		39.8	293	\$3,157	2444	\$0.48	\$0.81	X	None	39.8	293	\$3,157	2444	\$0.81	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	93					
94 Medford Sq. - Davis Sq. Sta.		16.5	208	\$1,553	682	\$0.48	\$1.80	X	None	16.5	208	\$1,553	682	\$1.80	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	94					
95 West Medford - Sullivan Sta.		27.9	324	\$2,547	763	\$0.48	\$2.86	X	None	27.9	324	\$2,547	763	\$2.86	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	95					
96 Medford Sq - Bennett St Alley via George		33.2	326	\$2,859	832	\$0.48	\$2.96	X	None	33.2	326	\$2,859	832	\$2.96	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	96					
97 Malden Sta. - Wellington Sta.		9.8	76	\$789	179	\$0.48	\$3.93	X	None	9.8	76	\$789	179	\$3.93	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	97					
99 N.E. Memorial Hosp. - Malden Center		31.3	345	\$2,808	555	\$0.48	\$4.58	X	None	31.3	345	\$2,808	555	\$4.58	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	99					
100 Elm St. & Fellsway - Wellington Sta.		20.3	227	\$1,826	418	\$0.48	\$3.89	X	None	20.3	227	\$1,826	418	\$3.89	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100					
101 Fellsway Garage - Sullivan Sta.		38.5	399	\$3,377	1973	\$0.48	\$1.23	X	None	38.5	399	\$3,377	1973	\$1.23	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	101					
104 Malden Ctr. Sta. - Sullivan Sta. via Ferry		31.2	307	\$2,691	1994	\$0.48	\$0.87	X	X	None	31.2	307	\$2,691	1994	\$0.87	X	I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	104				
105 Malden Ctr. Sta. - Sullivan Sta.		13.4	152	\$1,209	344	\$0.48	\$3.03	X	X	None	13.4	152	\$1,209	344	\$3.03	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	105				
106 Lebanon St. Loop - Wellington Sta.		34.5	358	\$3,028	1128	\$0.48	\$2.20	X	None	34.5	358	\$3,028	1128	\$2.20	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	106					
108 Linden Sq. - Wellington Sta. via Malden		38.1	391	\$3,333	1230	\$0.48	\$2.23	X	None	38.1	391	\$3,333	1230	\$2.23	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	108					
109 Linden Sq. - Sullivan Sta. via Broadway		27.9	282	\$2,426	1557	\$0.48	\$1.08	X	X	None	27.9	282	\$2,426	1557	\$1.08	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	109				
110 Wonderland Sta. - Wellington Sta.		29.4	330	\$2,653	1150	\$0.48	\$1.83	X	None	29.4	330	\$2,653	1150	\$1.83	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	110					
111 Woodlawn - Haymarket Sta.		78.5	850	\$6,995	4489	\$0.48	\$1.08	X	X	None	78.5	850	\$6,995	4489	\$1.08	X	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	111				
112 Wellington Sta. - Wood Island Sta.		33.2	328	\$2,868	807	\$0.48	\$3.07	X	Minor	33.2	328	\$2,868	807	\$3.07	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	112					
130 Linwood Ave&Lynde Sts Malden Ctr Sta		4.1	51	\$384	29	\$0.48	\$12.76	X	X	Major	0.0	0	\$0	0	\$0.00	X	X	X	-4.1	-51.0	-29.0	0.0	0.0	0.0	0.0	130			
132 Redstone Shopping Ctr. - Malden Ctr. Sta.		8.7	112	\$823	140	\$0.48	\$5.40	X	X	Moderate	12.7	161	\$1,196	195	\$5.65	X	X	4.0	49.2	55.0	I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	132
134 North Woburn - Wellington Sta.		40.3	458	\$3,648	1044	\$0.76	\$2.73	X	None	40.3	458	\$3,648	1044	\$2.73	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	134					
135 Wakefield Sq. - Oak Grove Sta.		0.9	14	\$91	10	\$0.48	\$8.59	X	None	0.9	14	\$																	

### Sunday bus service, current and proposed

X"=failed, "I"=failed but improved

Route number	Description	Current						Standards		Proposed						Standards		Change			Route number						
		Hours	Miles	Total cost	Ridership	Average fare	Avg. cost / pax	Span	Frequency	Loading	Sched. Adher.	Net cost/pax.	Hours	Miles	Total cost	Ridership	Avg. cost / pax	Span	Frequency	Loading	Sched. Adher.	Net cost/pax.	Hours	Miles	Ridership		
1	Harvard - Dudley Sta. via Mass. Ave.	76.3	638	\$6,260	6248	\$0.48	\$0.52	X	X	Minor	76.3	638	\$6,260	6248	\$0.52	X	I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1		
8	Harbor Point /U Mass - Kenmore Sta.	42.5	441	\$3,730	780	\$0.48	\$4.30	X	None	42.5	441	\$3,730	780	\$4.30	I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8			
9	City Point - Copley Sq. via Broadway	33.2	314	\$2,830	1213	\$0.48	\$1.85	X	None	33.2	314	\$2,830	1213	\$1.85	I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9			
10	City Point - Copley Sq. Via Boston Med. Ctr.	27.7	253	\$2,335	765	\$0.48	\$2.57	X	None	27.7	253	\$2,335	765	\$2.57	I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10			
11	City Point - Downtown via Bayview	31.2	319	\$2,726	787	\$0.48	\$2.98	X	None	31.2	319	\$2,726	787	\$2.98	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11			
15	Kane Sq. - Ruggles Sta.	20.0	184	\$1,690	1605	\$0.48	\$0.57	X	X	Minor	20.0	184	\$1,690	1605	\$0.57	X	I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15	
16	Forest Hills Sta. - U Mass.	26.1	277	\$2,308	1334	\$0.48	\$1.25	X	Minor	26.1	277	\$2,308	1334	\$1.25	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16			
17	Fields Corner Sta. - Andrew Sta.	10.6	95	\$884	705	\$0.48	\$0.77	X	Minor	10.6	95	\$884	705	\$0.77	I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17			
18	Ashmont Sta. - Andrew Sta.	7.8	67	\$648	91	\$0.48	\$6.64	X	X	Major	0.0	0	\$1	0	\$0.00	-7.8	-67.4	-91.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18
20	Fields Corner Sta. - Fields Corner Sta.	11.2	112	\$971	185	\$0.48	\$4.77	X	X	Major	11.2	112	\$971	190	\$4.63	X	I	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	20	
21	Ashmont Sta. - Forest Hills Sta.	7.7	58	\$614	0	\$0.48	\$0.00	X	Moderate	7.7	58	\$614	0	\$0.00	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21			
22	Ashmont Sta. - Ruggles Sta. via Jackson	53.7	594	\$4,816	3507	\$0.48	\$0.89	X	Minor	53.7	594	\$4,816	3507	\$0.89	I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22			
23	Ashmont Sta. - Ruggles Sta. via Wash.	59.3	566	\$5,065	3720	\$0.48	\$0.88	X	Minor	59.3	566	\$5,065	3720	\$0.88	I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23			
24	Wakefield Ave. - Mattapan Sta.	7.8	89	\$710	287	\$0.48	\$1.99	X	None	7.8	89	\$710	287	\$1.99	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24			
26	Ashmont Sta. - Norfolk & Wash. Belt	6.0	52	\$498	306	\$0.48	\$1.15	X	Minor	6.0	53	\$503	309	\$1.15	X	0.0	0.0	1.5	3.0	0.0	0.0	0.0	0.0	26			
27	Mattapan Sta. - Ashmont Sta.	6.3	53	\$519	188	\$0.48	\$2.28	X	None	6.3	53	\$519	188	\$2.28	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27			
28	Mattapan Sta. - Ruggles Sta. via Dudley	99.9	951	\$8,528	6569	\$0.48	\$0.82	X	None	99.9	951	\$8,528	6569	\$0.82	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28			
30	Mattapan Sta. - Roslindale Sq.	5.9	100	\$630	222	\$0.48	\$2.36	X	None	5.9	100	\$630	222	\$2.36	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30			
31	Mattapan Sta. - Forest Hills Sta.	32.5	320	\$2,806	1885	\$0.48	\$1.01	X	None	32.5	320	\$2,806	1885	\$1.01	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31			
32	Cleary Sq. - Forest Hills Sta.	31.1	436	\$3,054	2497	\$0.48	\$0.74	X	None	31.1	436	\$3,054	2497	\$0.74	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	32			
34E	Walpole Center - Forest Hills Sta.	28.2	397	\$2,771	1241	\$0.76	\$1.47	X	Minor	28.2	397	\$2,771	1241	\$1.47	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34E			
34	Dedham Line - Forest Hills Sta.	14.6	204	\$1,432	1059	\$0.48	\$0.87	X	None	14.6	204	\$1,432	1059	\$0.87	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34			
35	Dedham Mall - Forest Hills Sta.	10.3	114	\$922	475	\$0.48	\$1.46	X	None	10.3	114	\$922	475	\$1.46	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35			
36	Charles River Loop - Forest Hills Sta.	28.1	312	\$2,523	1410	\$0.48	\$1.31	X	Minor	28.3	320	\$2,558	1414	\$1.33	X	0.2	8.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	36		
37/38	Baker & Vermont Sts. - Forest Hills via Centre	9.8	95	\$839	159	\$0.48	\$4.80	X	X	None	9.8	95	\$839	159	\$4.80	X	I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37/38	
39	Forest Hills Sta. - Back Bay Sta.	120.4	1195	\$10,415	5687	\$0.42	\$1.41	X	None	120.4	1195	\$10,415	5687	\$1.41	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39			
40	Georgetowne - Forest Hills Sta.	0.0	0	\$0	0	\$0.48	\$0.00	X	Major	4.0	103	\$525	200	\$2.15	X	4.0	103.0	200.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40	
41	Centre & Elliot Sts. - Dudley Sta.	17.3	160	\$1,461	494	\$0.48	\$2.48	X	None	17.3	160	\$1,461	494	\$2.48	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	41			
42	Forest Hills Sta. - Ruggles via Wash.	18.3	180	\$1,577	757	\$0.48	\$1.60	X	None	18.3	180	\$1,577	757	\$1.60	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42			
43	Ruggles Sta. - Park & Tremont Sts.	31.3	232	\$2,488	1057	\$0.48	\$1.87	X	Minor	31.3	232	\$2,488	1057	\$1.87	I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43			
44	Jackson Sta. - Ruggles Sta. Via Humboldt	18.7	194	\$1,638	851	\$0.48	\$1.44	X	None	18.7	194	\$1,638	851	\$1.44	I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	44			
45	Franklin Park - Ruggles Sta. via Blue Hill	18.0	177	\$1,552	850	\$0.48	\$1.35	X	Minor	18.5	177	\$1,582	837	\$1.41	I	0.5	0.0	-13.0	0.0	0.0	0.0	0.0	0.				

### Sunday bus service, current and proposed

X"=failed, "I"=failed but improved

Route number	Description	Current					Proposed					Change					Route number										
		Hours	Miles	Total cost	Ridership	Average fare	Avg. cost / pax	Span	Frequency	Loading	Sched. Adher.	Net cost/pax.	Type of change	Hours	Miles	Total cost	Ridership	Avg. cost / pax	Span	Frequency	Loading	Sched. Adher.	Net cost/pax.	Hours	Miles	Ridership	
99 N.E. Memorial Hosp. - Malden Center		16.9	189	\$1,525	343	\$0.48	\$3.96	X	None	16.9	189	\$1,525	343	\$3.96	X	0.0	0.0	0.0							99		
100 Elm St. & Fellsway - Wellington Sta.		9.5	127	\$916	213	\$0.48	\$3.82	X	None	9.5	127	\$916	213	\$3.82	X	0.0	0.0	0.0							100		
101 Fellsway Garage - Sullivan Sta.		18.4	216	\$1,684	876	\$0.48	\$1.44	X	None	18.4	216	\$1,684	876	\$1.44	X	0.0	0.0	0.0							101		
104 Malden Ctr. Sta. - Sullivan Sta. via Ferry		14.0	171	\$1,303	974	\$0.48	\$0.86	X	None	14.0	171	\$1,303	974	\$0.86	I	0.0	0.0	0.0							104		
105 Malden Ctr. Sta. - Sullivan Sta.		10.9	128	\$1,001	237	\$0.48	\$3.74	X	None	10.9	128	\$1,001	237	\$3.74	X	0.0	0.0	0.0							105		
106 Lebanon St. Loop - Wellington Sta.		16.2	187	\$1,476	708	\$0.48	\$1.61	X	X	None	16.2	187	\$1,476	708	\$1.61	X	0.0	0.0	0.0							106	
108 Linden Sq. - Wellington Sta. via Malden		10.9	128	\$1,000	369	\$0.48	\$2.23	X	None	10.9	128	\$1,000	369	\$2.23	X	0.0	0.0	0.0							108		
109 Linden Sq. - Sullivan Sta. via Broadway		14.8	175	\$1,362	948	\$0.48	\$0.96	X	None	14.8	175	\$1,362	948	\$0.96	I	0.0	0.0	0.0							109		
110 Wonderland Sta. - Wellington Sta.		16.0	184	\$1,458	503	\$0.48	\$2.42	X	None	16.0	184	\$1,458	503	\$2.42	X	0.0	0.0	0.0							110		
111 Woodlawn - Haymarket Sta.		48.4	597	\$4,519	2881	\$0.48	\$1.09	X	None	48.4	597	\$4,519	2881	\$1.09	X	0.0	0.0	0.0							111		
112 Wellington Sta. - Wood Island Sta.		19.2	219	\$1,744	375	\$0.48	\$4.17	X	X	None	19.2	219	\$1,744	375	\$4.17		0.0	0.0	0.0							112	
134 North Woburn - Wellington Sta.		11.6	112	\$995	269	\$0.76	\$2.94	X	Major	23.8	345	\$2,366	448	\$4.52	X	12.2	232.4	179.0	134								
171 Dudley Station - Logan Airport		1.3	19	\$130	0	\$1.50	\$0.00		None	1.3	19	\$130	0	\$0.00		0.0	0.0	0.0								171	
210 Quincy Ctr. Sta. - No. Quincy Sta.		0.5	9	\$57	0	\$0.48	\$0.00		None	0.5	9	\$57	0	\$0.00		0.0	0.0	0.0								210	
211 Quincy Ctr. Sta. - Squantum		0.0	0	\$0	0	\$0.48	\$0.00		Major	4.0	27	\$309	65	\$4.27		4.0	26.6	65.0	211								
212 Quincy Ctr. Sta. - North Quincy Sta.		0.0	0	\$0	0	\$0.48	\$0.00		Moderate	4.0	27	\$309	50	\$5.70	X	4.0	26.6	50.0	212								
215 Quincy Ctr. Sta. - Ashmont Sta.		16.2	207	\$1,532	353	\$0.48	\$3.86	X	None	16.2	207	\$1,532	353	\$3.86	X	0.0	0.0	0.0							215		
216 Quincy Ctr. Sta. - Houghs Neck		15.8	234	\$1,588	733	\$0.48	\$1.69	X	None	15.8	234	\$1,588	733	\$1.69	X	0.0	0.0	0.0							216		
220 Quincy Ctr. Sta. - Hingham Ctr.		16.7	274	\$1,754	391	\$0.48	\$4.01	X	None	16.7	274	\$1,754	391	\$4.01	X	0.0	0.0	0.0							220		
222 Quincy Ctr. Sta. - East Weymouth		15.8	224	\$1,558	397	\$0.48	\$3.44	X	None	15.8	224	\$1,558	397	\$3.44	X	0.0	0.0	0.0							222		
225 Quincy Ctr. Sta. - Weymouth Landing		12.4	164	\$1,187	474	\$0.48	\$2.02	X	None	12.4	164	\$1,187	474	\$2.02	X	0.0	0.0	0.0							225		
230 Quincy Ctr. Sta. - Brockton/Holbrook Line		19.4	360	\$2,154	309	\$0.76	\$6.21	X	X	Moderate	16.7	315	\$1,868	319	\$5.10	X	I	-2.7	-45.3	10.0	230						
236 Quincy Ctr. Sta. - South Shore Plaza		10.0	152	\$1,010	248	\$0.48	\$3.59		None	10.0	152	\$1,010	248	\$3.59		0.0	0.0	0.0							236		
238 Quincy Ctr. Sta. - West St. & Willard St.		17.4	292	\$1,844	621	\$0.76	\$2.21	X	X	Minor	17.4	292	\$1,844	641	\$2.12	X	X	0.0	0.0	20.0	238						
240 Crawford Sq. - Ashmont Sta.		16.1	314	\$1,827	615	\$0.76	\$2.21	X	X	None	16.1	314	\$1,827	615	\$2.21	X	X	0.0	0.0	0.0	240						
275 Downtown Boston - Long Island		11.4	244	\$1,356	0	\$0.00	\$0.00		None	11.4	244	\$1,356	0	\$0.00		0.0	0.0	0.0							275		
276 Boston City Hosp. - Long Island Hosp.		11.2	0	\$651	0	\$0.00	\$0.00		None	11.2	0	\$651	0	\$0.00		0.0	0.0	0.0							276		
277 L. Shattuck Hosp. - Downtown Boston		0.6	0	\$33	0	\$0.00	\$0.00		None	0.6	0	\$33	0	\$0.00		0.0	0.0	0.0							277		
350 Burlington - Alewife Sta.		19.6	347	\$2,126	421	\$0.76	\$4.29	X	None	19.6	347	\$2,126	421	\$4.29	X	0.0	0.0	0.0							350		
Silver Dudley Sta. - Downtown		82.9	565	\$8,043	5525	\$0.42	\$1.04	X	None	82.9	565	\$8,043	5525	\$1.04	X	0.0	0.0	0.0	Silver								

Note: Per policy, Lynn service not shown due to recent major changes.

# **APPENDIX B:**

# Comparative Evaluation

## Comparative evaluation of recommended changes: Weekday

Route	Current		Projected		Change			Net cost/pax	Summary
	Riders	Net cost/pax	Riders	Net cost/pax	Hours	Miles	Riders		
130	144	\$5.40	0	\$0.00	-7.4	-96.20	-144	(\$5.40)	Midday and peak hour service to Lynde St.
3	284	\$3.43	0	\$0.00	-9.7	-101.40	-284	(\$3.43)	Discontinue when Silver Line to BMIP opens
221	136	\$2.63	134	\$1.00	-1.7	-19.20	-2	(\$1.63)	Redefine as one AM, one afternoon, one PM trip
4	259	\$5.72	308	\$4.19	-1.7	0.90	49	(\$1.53)	Route change to serve South Station
351	238	\$4.45	320	\$3.69	1.6	32.50	82	(\$0.76)	Add Mall Road service
236	411	\$4.45	478	\$3.76	-0	0.00	67	(\$0.69)	Increase span of service
84	221	\$3.28	203	\$2.68	-1.2	-21.90	-18	(\$0.61)	Reduce PM Peak service to 30-35 minute hdwy
211	613	\$3.24	718	\$2.69	-0	0.00	105	(\$0.54)	Partially redirect to Quarry St
217	207	\$5.33	303	\$4.81	4.6	32.00	96	(\$0.52)	Extend to Quincy Ctr; annual midday trip
325	359	\$5.66	315	\$5.19	-3	-57.10	-44	(\$0.47)	Headways stretched
68	286	\$3.67	274	\$3.25	-2	-16.80	-12	(\$0.42)	Reduce midday service to one trip every 70 mins
42	3783	\$0.88	3774	\$0.57	-9	-206.00	-9	(\$0.31)	Service to Dudley only, Mon-Sat
212	222	\$2.75	244	\$2.46	-0	0.00	22	(\$0.29)	Better span
55	726	\$3.07	710	\$2.83	-2.9	-20.20	-16	(\$0.24)	Cut service after 9PM due to light ridership
85	402	\$2.41	405	\$2.18	-1	-9.20	3	(\$0.23)	Headway, span of service change
500	746	\$3.26	651	\$3.05	-5	-81.60	-95	(\$0.21)	Reduce peak frequency to every 15-25 mins
76	626	\$5.68	646	\$5.51	0.2	0.00	20	(\$0.17)	Route half of trips into Base but not airfield
43	2648	\$1.62	2529	\$1.48	-6.8	-42.30	-119	(\$0.13)	Stretch headways due to ridership drop
7	2568	\$2.35	2577	\$2.24	-2.5	0.00	9	(\$0.11)	All trips via Summer St. *
245	501	\$3.48	514	\$3.38	-0	0.00	13	(\$0.10)	Add later trip; drop one mid-morning trip.
89	3586	\$1.01	3811	\$0.91	-0	-10.00	225	(\$0.10)	Route half of trips to Davis
19	2058	\$0.98	2241	\$0.89	0.5	7.40	183	(\$0.09)	Combine w/ 8, Kenmore via LMA, improve freq.
77	7595	\$1.56	7587	\$1.47	-5.6	-31.50	-8	(\$0.08)	Make local all day, eliminate most 77A
50	991	\$1.94	1004	\$1.91	-0	0.00	13	(\$0.03)	Combine branches middays
240	2194	\$2.47	2214	\$2.44	-0	0.00	20	(\$0.03)	New afternoon trip
134	1605	\$2.34	2005	\$2.33	12	120.00	400	(\$0.02)	Anderson RTC svc
27	578	\$1.38	563	\$1.36	-0.4	-4.50	-15	(\$0.01)	Reduce midday service
71	4823	\$1.35	4818	\$1.34	-1	-7.90	-5	(\$0.01)	Stretch early AM headway
220	1669	\$3.04	1727	\$3.03	1.3	17.70	58	(\$0.01)	More service AM peak, Bicknell-Quincy Ctr
39	17405	\$0.82	17408	\$0.82	-0.2	-1.80	3	(\$0.00)	Start one PM outbound trip at LMA
51	1677	\$2.01	1716	\$2.01	1	14.60	39	\$0.00	New early AM trip
45	3766	\$1.22	3757	\$1.22	-0	0.00	-9	\$0.00	Stretch PM peak headway to improve reliability
9	4628	\$1.31	4660	\$1.31	1	8.30	32	\$0.01	Improve frequency 7-8pm
34	3133	\$1.47	3133	\$1.47	0.1	4.40	0	\$0.01	One new 8pm trip
1	12557	\$0.69	12647	\$0.69	2.6	19.60	90	\$0.01	Extend PM Peak service from 7:15 PM - 8:00 PM
33	871	\$1.95	914	\$1.95	1	4.00	43	\$0.01	2 new trips to Forest Hills, new evening short trip
CT1	2507	\$1.02	2526	\$1.04	0.7	6.40	19	\$0.01	Add 2 PM trips
87	3720	\$1.04	3732	\$1.06	0.9	5.00	12	\$0.01	Later service to Arlington
24	1629	\$1.32	1658	\$1.34	0.8	13.80	29	\$0.02	Add more midday service
26	1829	\$0.97	1847	\$0.99	0.5	14.50	18	\$0.02	Extend to Blue Hill Ave when 21 is not running
501	2268	\$1.46	2284	\$1.49	1.1	19.40	16	\$0.03	Add 6:50 PM trip; adj. headways for reliability
32	8218	\$0.85	8218	\$0.88	2	22.10	0	\$0.03	Add AM peak service
225	2166	\$1.90	2178	\$1.95	1.2	7.00	12	\$0.05	More service AM peak, Shipyard-Quincy Ctr
86	5139	\$1.02	5194	\$1.07	4.8	0.00	55	\$0.05	Split route in two at Harvard
8	5039	\$1.87	5039	\$1.94	3	5.00	0	\$0.06	Schedule change, hold at Ruggles, combine w/ 19
505	1317	\$2.55	1317	\$2.63	1	0.00	0	\$0.08	Increase running time for sched. Adher.
30	1938	\$1.39	2028	\$1.48	2.9	28.40	90	\$0.08	Add a bus to AM (hrs: 1.9 peak 0.3 off-peak)
CT3	1029	\$2.77	1045	\$2.87	1.7	19.90	16	\$0.10	Stretch headway, extend to 1010 Mass Ave
64	1608	\$2.20	1595	\$2.33	2	19.80	-13	\$0.13	Stretch peak headways, add evening service
106	2504	\$1.53	2597	\$1.69	3.6	96.10	93	\$0.17	Extend some weekday peak trips to Lynde Street
558	391	\$3.63	402	\$3.87	0.9	28.00	11	\$0.24	Extend to Riverside Sta; change freq. to 70 min
11	2789	\$1.99	2867	\$2.31	9.7	97.50	78	\$0.32	Extend to South Sta, A st during day
355	13	\$28.98	10	\$29.92	-0.7	-12.40	-3	\$0.94	Eliminate inbound trip at 3:30 PM
503	0	\$0.00	330	\$2.17	7.3	168.80	330	\$2.17	New route: Brighton Ctr to Copley Square
6	334	\$3.84	97	\$7.29	-6	-68.80	-237	\$3.45	Shorten route when Silver Line II starts

\*When Silver Line phase 2 opens

## Comparative evaluation of recommended changes: Saturday

Route	Current		Projected		Change				Summary
	Riders	Net cost/pax	Riders	Net cost/pax	Hours	Miles	Riders	Net cost/pax	
130	29	\$12.76	0	\$0.00	-4.1	-51.00	-29	(\$12.76)	Discontinue Saturday service
59	391	\$5.50	297	\$3.69	-12.8	-125.30	-94	(\$1.82)	Stretch headway to 90 mins
65	280	\$4.99	228	\$3.73	-7	-57.40	-52	(\$1.26)	Stretch to hourly service
7	405	\$5.49	322	\$4.48	-10	-84.00	-83	(\$1.01)	Go via Summer St. Br; reduce freq.*
210	210	\$4.78	148	\$3.80	-5.5	-52.60	-62	(\$0.97)	Stretch to hourly service
42	1798	\$1.50	1790	\$0.91	-9	-197.00	-8	(\$0.60)	Service to Dudley only
55	303	\$4.36	282	\$3.91	-2.9	-20.20	-21	(\$0.44)	Cut service after 9PM due to light ridership
27	444	\$2.01	407	\$1.69	-2.5	-27.00	-37	(\$0.32)	Lexx frequent service
89	1573	\$0.90	1685	\$0.80	-0	-5.10	112	(\$0.10)	Route every other trip to Davis
20	609	\$3.32	623	\$3.23	-0	0.00	14	(\$0.09)	Extend to North Quincy Station
236	431	\$2.57	436	\$2.54	-0	0.00	5	(\$0.03)	Improve span
411	463	\$2.49	488	\$2.47	0.6	10.30	25	(\$0.02)	Add AM Inbound trip
86	1921	\$1.44	1991	\$1.46	3	0.00	70	\$0.02	Split route in two at Harvard
26	1075	\$1.05	1083	\$1.09	0.5	6.00	8	\$0.03	Extend to Blue Hill Ave
87	2292	\$0.98	2667	\$1.13	10.2	121.00	375	\$0.15	Extend service to Arlington
212	70	\$6.05	84	\$6.27	1.3	11.80	14	\$0.21	Better span of service
132	140	\$5.40	195	\$5.65	4	49.20	55	\$0.26	Better headways
24	615	\$2.28	643	\$2.60	2	58.00	28	\$0.32	More frequent service

\*When Silver Line phase 2 opens

## Comparative evaluation of recommended changes: Sunday

Route	Current		Projected		Change			Net Riders cost/pax	Summary
	Riders	Net cost/pax	Riders	Net cost/pax	Hours	Miles	Riders		
18	91	\$6.64	0	\$0.00	-7.8	-67.40	-91	(\$6.64)	Discontinue Sunday service
230	309	\$6.21	319	\$5.10	-2.7	-45.30	10	(\$1.12)	New schedule
60	267	\$5.06	265	\$4.77	-1	-10.30	-2	(\$0.29)	Trim last trip
55	232	\$5.12	200	\$4.88	-2.9	-20.20	-32	(\$0.24)	Cut service after 9pm
20	185	\$4.77	190	\$4.63	-0	0.00	5	(\$0.14)	Extend to North Quincy
238	621	\$2.21	641	\$2.12	-0	0.00	20	(\$0.09)	Add early trip, drop last trip
26	306	\$1.15	309	\$1.15	-0	1.50	3	(\$0.00)	Extend to Blue Hill Ave
36	1410	\$1.31	1414	\$1.33	0.2	8.00	4	\$0.02	Add AM trip
45	850	\$1.35	837	\$1.41	0.5	0.00	-13	\$0.06	Stretch midday headway for reliability
77	3118	\$1.46	3343	\$1.54	8	86.40	225	\$0.08	Improve frequency
57	3736	\$1.04	3986	\$1.12	8	86.40	250	\$0.08	Improve frequency
86	1101	\$1.78	1228	\$2.01	7.3	52.00	127	\$0.23	Split route in two at Harvard
134	269	\$2.94	448	\$4.52	12.2	232.40	179	\$1.58	Hourly service to N. Woburn
40	0	\$0.00	200	\$2.15	4	103.00	200	\$2.15	New service
50	0	\$0.00	175	\$2.52	4	103.00	175	\$2.52	New service
211	0	\$0.00	65	\$4.27	4	26.60	65	\$4.27	New service
59	0	\$0.00	200	\$4.99	11.8	143.00	200	\$4.99	New service
212	0	\$0.00	50	\$5.70	4	26.60	50	\$5.70	New service
191	0	\$0.00	12	\$13.93	2.5	9.50	12	\$13.93	New service

## **APPENDIX C:**

### **Proposed Service Delivery Policy**

## Chapter 1: Introduction

### Purpose

The purpose of the *Service Delivery Policy* is to ensure that the MBTA provides quality transit services that meet the needs of the riding public and are consistent with the MBTA's enabling legislation and other external mandates, such as Title VI of the Civil Rights Act of 1964, by:

- establishing Service Objectives that define the key performance characteristics of quality transit services;
- identifying quantifiable Service Standards that are used to measure whether or not the MBTA's transit services achieve the Service Objectives and to evaluate whether MBTA services are provided in an equitable manner (as defined by Title VI);
- outlining a service planning process that applies the Service Standards in an objective, uniform, and accountable manner; and
- involving the public in the Service Planning Process in a consistent, fair and thorough manner.

### Background

This document presents the 2004 update of the MBTA's *Service Delivery Policy*. This policy has evolved over time and seeks to improve the previous policies that governed the Authority's service standards and service planning process.

The immediate predecessor to this current document was the MBTA's 1996 *Service Delivery Policy*, which was based on a study that examined the service standards and service planning methods used by other North American transit systems.<sup>1</sup> The intent of the 1996 *Service Delivery Policy* was to improve the MBTA's performance by adopting best-practice techniques for planning and evaluating services. Implementation of the 1996 *Service Delivery Policy* was guided by a Service Standards Technical Advisory Committee (SSTAC), which advised the MBTA on the types of activities needed to fully develop the study's recommendations and put them into practice.

The 1996 *Service Delivery Policy* anticipated that future revisions to the policy would be necessary and appropriate after several years of experience with implementation. Accordingly, a number of modifications were proposed through the MBTA's *Preliminary 2002 Service Plan*, and the SSTAC was subsequently reconvened to review them. The SSTAC forwarded some of the proposed changes to the MBTA Board of Directors, but held others for further consideration. Those sent to the Board were approved, in

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<sup>1</sup> "Final report: Design of Service Quality Measures and Service Evaluation Standards," MacDorman & Associates, Dr. Nigel Wilson, November 27, 1995

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concept, on December 5, 2002, but were not immediately incorporated into the text of the *Service Delivery Policy*.

The SSTAC continued to meet during 2003 and 2004 to discuss other modifications to the *Service Delivery Policy* that were deemed of importance to the committee. This current document incorporates additional changes that were developed by the SSTAC. These revisions are designed to enhance the effectiveness of the policy and, thus, to improve the quality of MBTA services.

### **Revisions to the Service Delivery Policy**

As with the 1996 *Service Delivery Policy*, it is anticipated that this policy will require revisions over time. In particular, as new technologies that will enhance the MBTA's ability to collect and analyze data are adopted, policy modifications may be needed to adapt the use of this information for service planning purposes. Future revisions to the service standards or the service planning process must be reviewed by the public and approved by the MBTA Board of Directors before they can be implemented.

## Chapter 2: Services & Service Objectives

The MBTA operates a comprehensive set of transit services. This policy addresses all of the MBTA's fixed route services, including:

- **Bus:** For the purposes of this policy, "Bus" encompasses all rubber-tired vehicles, including diesel, CNG, trackless trolley, dual-mode, etc. The MBTA operates several different types of bus services including:

- Local Bus Routes provide full weekday service between 7:00 AM and 6:00 PM for all trip purposes. In general, stops on local routes are closely spaced (where practical), and pick-ups/drop-offs are allowed at all stops over the entire route; however, some local routes operate with limited stops.
- Key Bus Routes are similar to local routes, but generally operate longer hours and at higher frequencies to meet high levels of passenger demand in high-density travel corridors. Some key bus routes operate in dedicated rights-of-way as bus rapid transit (BRT). A list of Key Bus Routes can be found in Addendum A of this policy. Addendum A will be updated as changes to key route designations occur.

In concert with light rail and heavy rail (discussed below), the Key Bus Routes ensure basic geographic coverage of frequent service in the densest areas of the city's core and offer intermodal connections to other MBTA services that extend throughout the region.

- Commuter Bus Routes provide a limited number of peak-direction trips during peak-periods for work commuting purposes. Stops are closely spaced (where practical) and pick-ups/drop-offs are allowed at all stops over the entire route.
- Express Bus Routes provide a limited number of peak-direction trips during peak-periods for work commuting purposes. A large part of any express route is characterized by high-speed, non-stop operation, and a limited number of stops are provided only near route termini. Some restrictions on drop-offs/pick-ups may apply.
- Community Bus Routes provide weekday service between 9:00 AM and 4:00 PM primarily for non-work commuting purposes. Stops are closely spaced (where practical) and pick-ups/drop-offs are allowed at all stops over the entire route.
- **Light Rail:** The MBTA's primary light rail system, the Green Line, provides local service in outlying areas through its surface operations and provides core subway services in the heart of the city with its underground operations. In

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addition, the MBTA operates the Mattapan High Speed Line, which serves as a Red Line extension from Ashmont Station to Mattapan via light rail.

- **Heavy Rail:** The MBTA operates three heavy rail lines—the Red Line, the Blue Line and the Orange Line—which also provide core subway services.
- **Commuter Rail:** The MBTA's commuter rail routes provide long haul, primarily commuter-oriented services, which link the outer portions of the region with downtown Boston.
- **Boat Services:** The MBTA provides Inner Harbor Ferry services for travel between destinations in Boston and Commuter Boat services from the South Shore to downtown Boston and Logan airport.

### Service Objectives

The MBTA's mission states that:

*With quality customer service as our guiding principle, the MBTA strives to be a premier public transit authority through our diverse and talented workforce.*

To evaluate progress toward achieving part of this mission, the MBTA has identified the following Service Objectives, which the Authority believes represent the most important characteristics of “premier” public transportation services:

- **Accessibility:** Services should be geographically available throughout the community and should operate at convenient times and frequencies
- **Reliability:** Services should be operated as scheduled
- **Safety:** Services should be provided a safe manner
- **Comfort:** Services should offer a pleasant and comfortable riding environment
- **Cost Effectiveness:** Services should be tailored to target markets in a financially sound and cost-effective manner.

### Service Standards

For each of the Service Objectives, the MBTA has established quantifiable Service Standards, which allow the MBTA to evaluate the performance of MBTA services relative to each of the Service Objectives. These Service Standards are summarized in the following table and are discussed in detail in the Chapter 3.

**MBTA Service Delivery Policy** **DRAFT 2004 Update****Table 1: Summary of Service Standards**

<b>Service Objective</b>	<b>Service Standard/Guideline</b>
<b>Accessibility</b>	<ul style="list-style-type: none"><li>• Coverage</li><li>• Span of Service</li><li>• Frequency of Service</li></ul>
<b>Reliability</b>	<ul style="list-style-type: none"><li>• Schedule Adherence</li></ul>
<b>Safety &amp; Comfort</b>	<ul style="list-style-type: none"><li>• Vehicle Load</li></ul>
<b>Cost Effectiveness</b>	<ul style="list-style-type: none"><li>• Net Cost/passenger</li></ul>

## Chapter 3: Service Standards

The Service Standards provide a framework for measuring the performance of MBTA services and are used as a part of the Service Evaluation Process, which is discussed in Chapter 4. Through the Service Evaluation Process, data collected on MBTA services are compared against the Service Standards to determine whether or not individual existing services perform at acceptable levels and to evaluate the potential of possible service changes. The Service Standards are also used to compare the performance of existing services, service changes, and proposed new services to prioritize the allocation of resources within the system.

Because the overall levels of funding for service are determined through the annual budget process, the Service Evaluation Process using the Service Standards helps to ensure an effective allocation of budgeted funds. The Service Standards and Service Evaluation Process can also be used to identify service improvements that are not feasible within the existing budget and could be considered for future funding.

Each of the Service Standards is expressed as either a threshold that must be met, or a guideline that the Authority strives to meet. Following is a discussion of the MBTA Service Standards, in the context of the Service Objective to which each applies. These Standards address the fixed route modes operated by the MBTA (as described in Chapter 2).

### Accessibility Service Standards

The Accessibility standards/guidelines define the minimum levels of service that will provide access to the transit system, in terms of geographic Coverage, the length of the service day (Span of Service) and the Frequency of Service. Each of these standards varies by mode.

- **Coverage Guidelines**

An important aspect of providing the region with adequate access to transit services is the geographic coverage of the system. Coverage is expressed as a guideline rather than a standard, because uniform geographic coverage cannot always be achieved due to constraints such as topographical and street network restrictions. In addition, coverage in some areas may not be possible due to the infeasibility of modifying existing routes without negatively affecting their performance.

The Coverage guidelines are established specifically for the service area in which bus, light rail, and heavy rail operate, as riders most frequently begin their trips on these services by foot. Because commuter rail is usually accessed via the automobile, the coverage guidelines do not apply in areas where commuter rail is the only mode provided by the MBTA.

**Table 2: Coverage Guidelines**

Service Days	Minimum Coverage
Weekdays & Saturday	Access to transit service will be provided within a $\frac{1}{4}$ mile walk to residents of areas served by bus, light rail and/or heavy rail with a population density of greater than 5,000 persons per sq/mile.
Sunday	On Sunday, this range increases to a $\frac{1}{2}$ mile walk.

- **Span of Service Standards**

Span of Service refers to the hours during which service is accessible. The MBTA has established Span of Service Standards that define the minimum period of time that any given service will operate. This provides customers with the confidence that particular types of services will be available throughout the day.

The Span of Service Standards, stated in Table 3 below, vary by mode and by day of the week, reflecting the predominant travel flows in the region. The standards require that the first trip in the morning in the peak direction of travel (typically toward Boston) must arrive at the route terminal at or before the beginning span of service time (e.g., 7:00 AM for local bus). At the end of service day, the last trip in the evening in the peak direction of travel (typically away from Boston) must depart from the route terminal at or after the ending span of service time (e.g., 6:00 PM for local bus).

**Table 3: Span of Service Standards**

Mode	Day	Minimum Span of Service
Bus*	Local Routes	Weekday 7:00 AM – 6:30 PM  <b>Guideline for high density areas:</b> Saturday 8:00 AM – 6:30 PM Sunday 10:00 AM – 6:30 PM
	Community Routes	10:00 AM – 4:00 PM
	Express/Commuter Routes	7:00 – 6:30 PM (no service required 9:00 AM – 4:00 PM)
	Key Bus Routes	Weekday 6:00 AM – midnight Saturday 6:00 AM – midnight Sunday 7:00 AM – midnight
Heavy Rail	Weekday Saturday Sunday	6:00 AM – midnight 6:00 AM – midnight 7:00 AM – midnight
Light Rail	Weekday Saturday Sunday	6:00 AM – midnight 6:00 AM – midnight 7:00 AM – midnight
Commuter Rail	Weekday Saturday	7:00 AM – 10:00 PM 8:00 AM – 6:30 PM
Ferry/Commuter Boat	Weekday	7:00 AM – 6:30 PM

\* For the purposes of the Frequency of Service standard, "Bus" encompasses all rubber-tired vehicles, including diesel, CNG, trackless trolley, dual-mode, etc. The definitions of types of bus services are found in Chapter 2.

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The minimum Span of Service indicated in the table above may be extended at either end of the day, based on customer demand and in accordance with the other service standards stated in this policy.

- **Frequency of Service Standards**

To maintain accessibility to the transportation network within a reasonable waiting period, the MBTA has established minimum frequency of service levels for each mode, by time of day. On less heavily traveled services, these minimum levels dictate the frequency of service, regardless of customer demand.

Table 4 shows the weekday Time Period definitions used by the MBTA for all modes for both the Frequency of Service and Vehicle Load Standards. Because travel patterns on the weekend are different than on weekdays, specific time periods are not defined for Saturdays and Sundays. Table 5 shows the Minimum Frequency of Service levels for each mode by time period.

**Table 4: MBTA Weekday Time Period Definitions**

Time Period	Definition
Early AM	6:00 AM – 6:59 AM
AM Peak	7:00 AM – 8:59 AM
Midday Base	9:00 AM – 1:29 PM
Midday School	1:30 PM – 3:59 PM
PM Peak	4:00 PM – 6:29 PM
Evening	6:30 PM – 9:59 PM
Late Evening	10:00 PM – 11:59 PM
Night/Sunrise	12:00 AM – 5:59 AM

**Table 5: Minimum Frequency of Service Standards**

Mode	Weekday Time Periods	Minimum Frequency*
Bus**		
Local/Community Rts.	AM & PM Peak	30-minute headway
	All Other Periods	60-minute headway (Mid-day policy objective of 30-minute headway in high density areas)
	Saturday & Sunday – all day	60-minute headway
Express/Commuter Rts.	AM Peak	3 trips in the peak direction
	PM Peak	3 trips in the peak direction
Key Routes	AM & PM Peak	10-minute headway
	Early AM & Midday Base/ School	15-minute headway
	Evening & Late Evening	20-minute headway
	Saturday – all day	20-minute headway
	Sunday – all day	20-minute headway
Light Rail/Heavy Rail	AM & PM Peak Periods	10-minute headway
	All Other Periods	15-minute headway
	Saturday & Sunday – all day	15-minute headway

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Mode	Weekday Time Periods	Minimum Frequency*
Commuter Rail	AM & PM Peak Periods	3 trips in peak direction
	All Other Periods	180-minutes in each direction
	Saturday – all day	180-minutes in each direction
Ferry/Commuter Boat	AM & PM Peak Periods	30-minute headway in peak direction
	Off-Peak Periods	120-minute headway

\*The Minimum Frequency of Service standards are primarily expressed as "Headways," which indicate the number of minutes scheduled between trips on a route.

\*\* For the purposes of the Frequency of Service standard, "Bus" encompasses all rubber-tired vehicles, including diesel, CNG, trackless trolley, dual-mode, etc. The definitions of types of bus routes are found in Chapter 2.

On heavily used services, the minimum frequency of service levels may not be sufficient to meet customer demand. When load levels indicate that additional service is warranted, as defined in the Vehicle Load Standard, the frequency of service will be increased to provide a sufficient number of vehicles to accommodate passenger demand.

## Reliability Service Standards

The on-time performance of service is affected by many variables, including traffic congestion, accidents, weather, road/track conditions, infrastructure maintenance work, vehicle failures, etc. The Schedule Adherence Standards provide a way of measuring how reliably services adhere to the published schedules. If a service does not pass the Schedule Adherence Standards, the MBTA will determine the reason why it does not perform reliably and will take action to correct the problems. In terms of service planning, this may mean adjusting running times, changing headways, etc.

- **Schedule Adherence**

Schedule Adherence Standards vary by mode and provide the tools for evaluating the on-time performance of the individual MBTA routes/services within each mode. The Schedule Adherence Standards also vary, based on frequency of service; because, passengers using high-frequency services are generally more interested in regular, even headways than in strict adherence to published timetables, whereas, on less frequent services passengers expect arrival/departures to occur as published.

**Bus Schedule Adherence Standards:** The environment in which buses operate makes it difficult to provide bus service with the same degree of precision that is possible for some other modes. Therefore, the Schedule Adherence Standards for bus routes are designed to ensure that routes operate as reliably as possible—given their uncertain environment—without early departures, chronic delays, or unpredictable wait and/or travel times.

The Bus Schedule Adherence Standards establish two separate thresholds to measure on-time performance. The first measures the on-time performance of each trip on the route. The second measures the on-time performance of the route itself, based on the percent of trips throughout the day that operate on time.

1. **Bus Trip Tests:** To determine whether or not individual trips on a route are on time, the MBTA uses two different tests. These tests are based on the type of service, as determined by its frequency. For the purposes of the Bus Schedule Adherence Standards, the two types services are defined as follows:

- **Scheduled Departure Service:** A route is considered to provide scheduled departure service for any part of the day in which it operates less frequently than one trip every 10 minutes (headway  $\geq$ 10 minutes). For scheduled departure services, customers generally time their arrival at bus stops to correspond with the specific scheduled departure times.
- **Walk-Up Service:** A route is considered to provide walk-up service for any part of the day in which it operates more frequently than one bus every 10 minutes (headway  $<$ 10 minutes). For walk-up service, customers can arrive at a stop without looking at a schedule and expect only a brief wait. There are two important indicators of on-time performance for walk-up service. One is how evenly spaced the buses are, and the other is how closely the actual duration of the trip approximates the scheduled travel time.

A route might operate entirely with walk-up service, entirely with scheduled departure service, or with a combination of both throughout the day. Because any given route may have both types of service, each trip is measured individually to determine whether or not it is on time, according to the type of service that it provides. Therefore, there are two separate trip tests that are applied to the trips on any given route before the whole route can be tested for Schedule Adherence.

- **On Time Test for Scheduled Departure Trips:** To be considered on time, any trip with a leading headway scheduled for 10 minutes or more must meet all of the following conditions:
  - The trip must start between 0 minutes before and 3 minutes after its scheduled departure time.
  - The trip must leave the route midpoint(s) between 0 minutes before and 7 minutes after its scheduled departure time (midpoints are calculated only for routes on which the data is collected using CAD/AVL).
  - The trip must arrive at its destination between 3 minutes before and 5 minutes after its scheduled arrival time.
- **On Time Test for Walk-Up Trips:** To be considered on time, any trip with a leading headway scheduled for less than 10 minutes must meet all of the following conditions:
  - The trip must start within 25% of its scheduled headway. *For example, if "trip A" is scheduled to start at 7:30 AM and the route's next trip "trip B" is scheduled to start at 7:38 AM, trip B has an 8-*

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minute scheduled headway. Therefore, trip B must start 6 to 10 minutes [ $8 \pm (8 \times 25\%)$ ] after trip A actually departs the midpoint to be considered on time.

- The trip must leave the midpoint(s) within 50% of its scheduled headway (midpoints are calculated only for routes on which the data is collected using CAD/AVL). Continuing the above example, if trip B is scheduled to leave a midpoint 8 minutes after trip A is scheduled to leave it, then trip B must leave the midpoint 4 to 12 minutes [ $8 \pm (8 \times 50\%)$ ] after trip A actually departs the midpoint to be considered on time.
- The trip's running time must be within 20% of its scheduled running time. Continuing the above example, if trip B is scheduled to take 30 minutes from the beginning of the route to the end, the actual trip time must be 24 to 36 minutes [ $30 \pm (30 \times 20\%)$ ] to be considered on time.

2. **Bus Route Test:** The second part of the Bus Schedule Adherence Standard determines whether or not a route is on time, based on the proportion of trips on the route are on time over the entire service day (regardless of which types of trips they are).

- **On Time Test for a Bus Route:** For a Bus Route to be considered on time, 75% of all trips on the route (in both directions) over the entire service day must pass their trip on-time tests.

**Table 6: Summary of Bus Schedule Adherence Standard**

Trip Test	Beginning of Route	Mid-Route Time Point(s)*	End of Route
Scheduled Departure Trips (Headways $\geq$ 10 minutes):	Start 0 minutes early to 3 minutes late	Depart 0 minutes early to 5 minutes late	Arrive 3 minutes early to 5 minutes late
Walk-up Trips (Headways $<$ 10 minutes):	Start within 25% of scheduled headway	Leave within 50% of scheduled headway	Running time within 20% of scheduled running time
Route Test	<b>For any given bus route to be in compliance with a the Schedule Adherence Standard, 75% of all trips on must adhere to the above measures over the entire service day.</b>		

\*For Schedule Adherence, mid-route time points will be used only for routes on which the on-time performance data has been collected using CAD/AVL equipment.

Exceptions:

- Express routes that serve only two points do not have a midpoint. Other routes must have at least one midpoint. The MBTA will add additional midpoints to certain routes based on their distance, running time and frequency.
- A schedule may note that certain trips will not leave until another vehicle arrives and allows passengers to transfer. (For instance, the last bus trip of the day might wait for passengers from the last train of the day.) When applying the standard to these trips the scheduled departure, midpoint and arrival times may be shifted forward by the amount of time the bus had to hold for connecting passengers.

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- If a series of trips alternate 9- and 10-minute headways, they may all be considered walk-up trips.
- The first trip of the day, which does not have a leading headway, is considered a scheduled departure trip.

**Light Rail & Heavy Rail Schedule Adherence Standards:** As with frequent bus services, passengers on light rail and heavy rail do not rely on printed schedules, but expect trains to arrive at prescribed headways. Therefore, schedule adherence for light rail and heavy rail is measured similarly to the way in which frequent bus service is measured. The percent of individual trips that are on time is calculated, based on a measure of how well actual headways correlate to scheduled headways. In addition, the percent of trip times that correspond to scheduled trip times is measured.

Two different measures are used to evaluate headway performance. For surface light rail and heavy rail, Schedule Adherence is measured based on the percent of trips that operate within 1.5 scheduled headways. For example, a trip with a 4-minute headway would be considered late if the observed headway were greater than 6 minutes (1.5 x 4 minutes). Because the headways in the core area for light rail are less than two minutes, Schedule Adherence is measured by the percent of trips with headways less than 3 minutes. Table 7 provides a summary of the Schedule Adherence standards for Light Rail and Heavy Rail services.

**Table 7: Schedule Adherence Standards for Light Rail & Heavy Rail**

Mode	Headway Performance	Trip Time Performance
Light Rail – Surface	85% of all trips operated within 1.5 scheduled headways over the entire service day.	95% trips operated within 5 minutes of scheduled total trip time over the entire service day.
Light Rail – Subway	95% of all service operated with headways less than 3 minutes over the entire service day.	95% of all trips operated within 5 minutes of scheduled trip time over the entire service day.
Heavy Rail	95% of all trips within 1.5 headways over the entire service day.	95% of all trips operated within 5 minutes of scheduled trip time over the entire service day.

**Commuter Rail & Ferry/Commuter Boat:** The Schedule Adherence standards for Commuter Rail and Ferry/Commuter Boat measure the percent of trips that depart/arrive within 5 minutes of scheduled departure/arrival times. These standards reflect the long distances and wide station spacing of commuter rail, and the absence of intermediate stations on most boat services. Table 8 shows the Schedule Adherence standards for Commuter Rail and Ferry/Commuter Boat services.

**MBTA Service Delivery Policy DRAFT 2004 Update****Table 8: Schedule Adherence Standards for Commuter Rail & Ferry/Commuter Boat**

Mode	Standard
Commuter Rail	95% of all trips departing and arriving at terminals within 5 minutes of scheduled departure and arrival times
Ferry/Commuter Boat	95% of all trips departing and arriving at ports within 5 minutes of scheduled departure and arrival times

**Safety & Comfort Service Standard**

The public's perception of comfort and the reality of public safety are influenced by the number of passengers on the vehicle and whether or not a seat is available to each rider for all or most of the trip. The Vehicle Load Standards, which vary by mode and time of day, establish the average maximum number of passengers allowed per vehicle to provide a safe and comfortable ride.

- **Vehicle Load**

As indicated in the Frequency of Service Standard, the level of service provided by the MBTA is primarily a function of the demand for that service, as demonstrated through the number of customers utilizing the service at different times during the day. On weekends and during some weekday time periods, most MBTA services operate with sufficient frequency to provide every passenger with a seat. However, during the heaviest weekday travel times or locations some passengers will need to stand.

During time periods when some passengers will be standing, the MBTA will provide sufficient service so that vehicles are not excessively crowded. The purpose of the Vehicle Load Standard is to define the levels of crowding that are acceptable by mode and time period. The time periods used by the MBTA for all modes, for both the Frequency of Service and Vehicle Load Standards, are defined earlier in this chapter (see Frequency of Service Standard).

Because heavy and light rail in the core area are heavily used throughout the day, some standees can be expected during all time periods. For the purposes of this policy, the core area, as it relates to the heavy rail and light rail Vehicle Load Standard, is defined as follows:

**Table 9: MBTA Core Area Boundaries**

Light Rail & Heavy Rail Core Area	
Blue Line	Bowdoin to Aquarium
Orange Line	Back Bay to North Station
Red Line	Kendall to South Station
Green Line	All underground stations as well as Lechmere, Science Park, Prudential, and Symphony

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By mode and time period, the acceptable levels of crowding are shown in the following table. The load standards in the table are expressed as a ratio of the number of passengers on the vehicle to the number of seats on the vehicle.<sup>2</sup> To determine whether a service has an acceptable level of crowding, the vehicle loads are averaged over specified periods of time. Due to scheduling constraints and peaking characteristics, some individual trips may exceed the load levels expressed in the standards.

For all modes the load standards shown represent average maximum loads. On weekdays, the loads cannot exceed the standard when averaged over any 30-minute segment of an Early AM, AM Peak, Midday School or PM Peak period, or any 60-minute segment of a Midday Base, Evening, Late Evening or Night/Sunrise period. On weekend days, the loads cannot exceed the standard when averaged over any 60-minute segment of the whole service day.

**Table 10: Vehicle Load Standards by Mode**

Mode	Time Period	Passengers/ Seats <sup>2</sup>
Bus*	Early AM, AM Peak, Midday School & PM Peak	140%
	Midday Base, Evening, Late Evening, Night/Sunrise & Weekends	
	Surface portions of routes	100%
	Tunnel portions of routes	140%
Green Line	Early AM, AM Peak, Midday School & PM Peak	225%
	Midday Base, Evening, Late Evening, Night/Sunrise & Weekends	
	Core Area	140%
	Surface	100%
Red Line #1 & 2 Cars	Early AM, AM Peak, Midday School & PM Peak	270%
	Midday Base, Evening, Late Evening, Night/Sunrise & Weekends	
	Core Area	140%
	Surface	100%
Red Line #3 Cars	Early AM, AM Peak, Midday School & PM Peak	334%
	Midday Base, Evening, Late Evening, Night/Sunrise & Weekends	
	Core Area	174%
	Surface	100%
Orange Line	Early AM, AM Peak, Midday School & PM Peak	225%
	Midday Base, Evening, Late Evening, Night/Sunrise & Weekends	
	Core Area	140%
	Surface	100%
Blue Line	Early AM, AM Peak, Midday School & PM Peak	225%
	Midday Base, Evening, Late Evening, Night/Sunrise & Weekends	
	Core Area	140%
	Surface	100%
Commuter Rail	Early AM, AM Peak, Midday School & PM Peak	110%
	Midday Base, Evening, Late Evening, Night/Sunrise & Weekends	100%

<sup>2</sup> For Bus, Light Rail and Heavy Rail, the load standard represents the ratio of passengers to seated capacity at the maximum load point. For Commuter Rail and Ferry services, the load standard represents the ratio of boarding passengers per vehicle to seated capacity.

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Mode	Time Period	Passengers/ Seats <sup>2</sup>
Ferry	Inner Harbor – All times	125%
	Outer Harbor – All times	100%

\* For the purposes of the load standard, "bus" encompasses all rubber-tired vehicles, including diesel, CNG, trackless trolley, dual-mode, etc.

In addition to looking at loads within time periods, the MBTA will routinely evaluate loads at the beginning and end of the service day to determine whether changes in frequency and/or span of service are warranted. The Net Cost/Passenger Standard will be used as one means of flagging routes that may be candidates for such changes.

Because there are a number of different types of vehicles in the MBTA's fleets at any given time, and because the fleets change over time, the actual seating capacity and maximum number of passengers allowed by the load standards for each type of vehicle are included in an addendum to this policy. This addendum will be regularly updated as the fleets change.

### Cost-Effectiveness Service Standard

The operation of MBTA service must be conducted within the resource levels budgeted for each mode. It is therefore important to have a measure that can compare the economic productivity of any given route in relation to other routes or to the system average for that mode. As a part of the 1996 *Service Delivery Policy*, the MBTA developed the Net Cost Per Passenger standard to measure the cost-effectiveness of bus routes. This Cost-Effectiveness Standard was developed only for bus at that time, because bus services were considered most appropriate for this type of comparative analysis. Unlike rail services, bus route alignments and services can be easily adjusted to accommodate changes in ridership patterns and demands. The MBTA will consider development of similar service productivity standards for other modes that would allow comparative evaluations within each mode and would support the efficient use of budgeted operating resources.

- **Bus Net Cost per Passenger Standard**

Net cost per passenger is calculated by subtracting the revenue generated on a per passenger basis from the cost of operating a route. This ratio reflects the benefits of a given service (measured in customers) against the public cost of operating the service.

During the regular service planning process, all bus routes and their respective net cost per passenger are compared against the bus system average. Routes that have net cost per passenger more than three times the system average are considered deficient and are subject to review for modifications that could improve the performance. Exceptions to the net cost per passenger standard can be made, on a case-by-case basis, due to extenuating circumstances such as geographic isolation.

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**Table 11: Bus Cost-Effectiveness Service Standard**

<b>Net Cost/Passenger:</b>	<u>Direct Operating Costs – Service Revenue</u> Boarding Customers
<b>Deficient Route:</b>	≥3 times the system average

## Key Bus Route Addendum

Key Bus Routes are similar to local routes, but have policy standards for a longer Span of Service and a higher Frequency of Service. The Key Bus Route Network was designed to complement the MBTA's light and heavy rail system and to ensure that all high-demand corridors have access to frequent transit service seven days a week.

The MBTA's *Service Delivery Policy* establishes Key Bus Route Service Standards, which make the Span of Service and the peak period Frequency of Service on Key Bus Routes equivalent to light and heavy rail. This guarantee of high-frequency service provides assurance to riders that they will not have to wait long for the next bus, even if they do not know the published schedule. To encourage this kind of "walk up" use of Key Bus Routes, they will be included with the light and heavy rail system on MBTA's "spider" maps as they are updated. Key Bus Routes will also be designated on the MBTA's system map, schedule cards and other marketing materials.

Initially, 15 routes were selected for the Key Bus Route system, based on their demonstrated heavy demand for service on all days of the week. The original Key Bus Routes were also chosen to provide high frequency service to areas of the region's urban core not served by light or heavy rail. The Silver Line, Boston's first Bus Rapid Transit (BRT) route, heads the list of Key Bus Routes. In addition, one corridor that is served at a high frequency by two bus routes was assigned Key Bus Route status.

The original 15 Key Bus Routes include:

- **Silver Line** Dudley Station – Downtown Crossing via Washington Street
- **Route 1** Dudley – Harvard via Mass. Ave.
- **Route 15** St. Peter's Square – Ruggles via Dudley
- **Route 22** Ashmont – Ruggles via Grove Hall
- **Route 23** Ashmont – Ruggles via Codman Square
- **Route 28** Mattapan – Ruggles
- **Route 32** Wolcott Square – Forest Hills
- **Route 39** Forest Hills – Back Bay
- **Route 57** Watertown – Kenmore via Oak Square
- **Route 66** Harvard – Dudley via Allston
- **Route 71** Watertown Square – Harvard via Mount Auburn St.
- **Route 73** Waverley – Harvard via Mount Auburn
- **Route 77** Arlington Heights – Harvard via Mass. Ave.
- **Route 111** Woodlawn – Haymarket Station
- **Routes 116 & 117** Broadway @ Park Avenue – Maverick Station (combined trunk portion of routes)

Going forward, additional Key Bus Routes may be designated based on consideration of a number of characteristics. Not all of these characteristics must be present in a given route to make it eligible for Key Bus Route status. Each route will be considered in the context of the MBTA's transit system as a whole and within available operating resources.

## **MBTA Service Delivery Policy *DRAFT* Addendum A**

The characteristics that may trigger consideration of a route for Key Bus Route status include:

- high ridership demand;
- connectivity within the system;
- geographic coverage;
- accommodation of major new development; and
- operation as BRT (all BRT route segments that operate in dedicated rights-of-way will automatically be designated as Key Bus Routes).